

(21) Application No 9304721.5

(22) Date of filing 08.03.1993

(30) Priority data

(31) 04050302

(32) 09.03.1992

(33) JP

(71) Applicant

Hitachi, Limited.

(Incorporated in Japan)

8 Kanda Surugadal 4-chome, Chiyoda-ku, Tokyo,  
Japan

(72) Inventors

Yoshimitsu Hashimoto

Kohji Watanabe

(74) Agent and/or Address for Service

Mewburn Ellis

2 Cursitor Street, London, EC4A 1BQ, United Kingdom

(51) INT CL<sup>8</sup>

G06F 15/24

(52) UK CL (Edition L)

G4A AUXF

(56) Documents cited

None

(58) Field of search

NO SEARCH POSSIBLE

(54) Inventory management for combination goods

(57) An inventory management program including a goods master file storing information on whether each good is for sale as a single item or as combination goods comprising a combination of a plurality of items. When the ordered goods are combination goods, the processing device checks the inventory master file to determine whether or not there is a sufficient number of the element goods in stock for filling the quantity of order. When there is a sufficient number of the goods, the processing device performs stock assignment and updating in which a number of assignment is subtracted from the number of stock of the element goods stored in the inventory master file. When there is not such a sufficient number of the element goods, the processing device performs either a process for purchasing a required number of the element goods or a process for assigning substitute goods.

FIG. 6

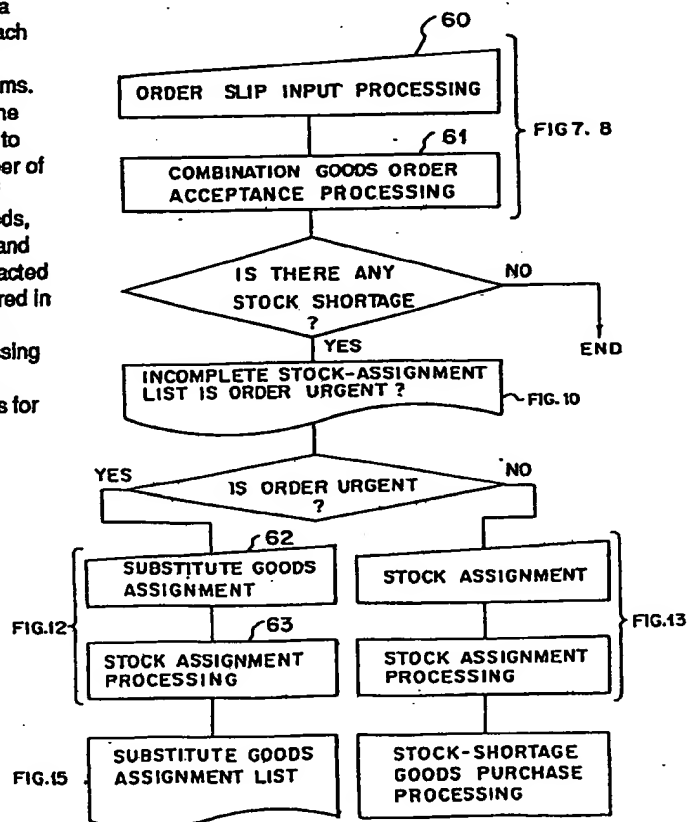
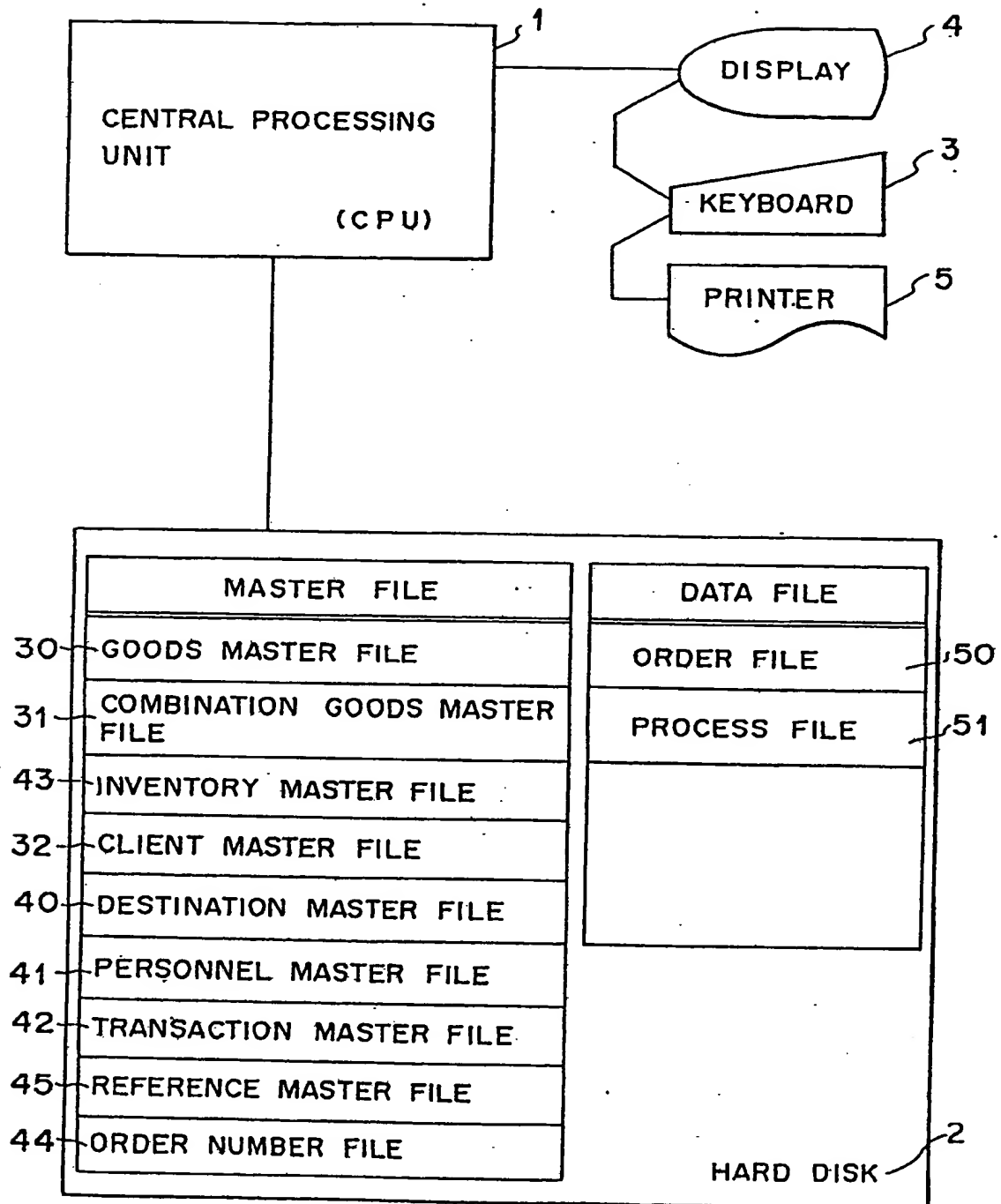


FIG. 1



# FIG.2

2/25

20

ORDER INPUT SLIP

PLACEMENT    YYY - 888888

YEAR MONTH DAY

88    88    88

ORDER TYPE	9999	K K K K	BUSINESS PERSONNEL	XXXXXX K K K K
CLIENT	XXXXXX	K K K K K K K K	END USER	N N N N N N N N
DESTINATION	XXX	K K K K K K K K	ORDER NO.	XXXXXXXXXXXXXXXXXX
DELIVERY TYPE	XXX	K K K K	MANAGEMENT	XXXXXXXXXX
DESIGNATION	9	K K	NUMBER 1	XXXXXXXXXXXXXXXXXX
REFERENCE	XXXXXX	N N N N N N N N N N N N N N	NUMBER 2	XXXXXXXXXXXXXXXXXX

GOODS CODE	QUANTITY OF ORDER	UNIT	UNIT PRICE	APPOINTED WAREHOUSE	WAREHOUSE DISCHARGE DATE	TYPE
XXXXXX	ZZ, ZZ9	K K	ZZ, ZZ9	999999	XXX	K
K K K K K K K K K K	XXXXXXXXXXXXXXXXXX	XXXXXXXXXX	999999	K K K		

CONFIRMATION ... (X)

9: ITEM FOR NUMERIC INPUT      N: ITEM FOR KANJI INPUT

8: ITEM FOR NUMERIC OUTPUT    K: ITEM FOR KANJI-OUTPUT

X: ITEM FOR ALPHANUMERIC/KANA INPUT

Y: ITEM FOR ALPHANUMERIC/KANA OUTPUT

3/25

FIG.3

(a) 30  
GOODS MASTER  
FILE(b) 31  
COMBINATION GOODS  
MASTER FILE(c) 32  
CLIENT MASTER FILE

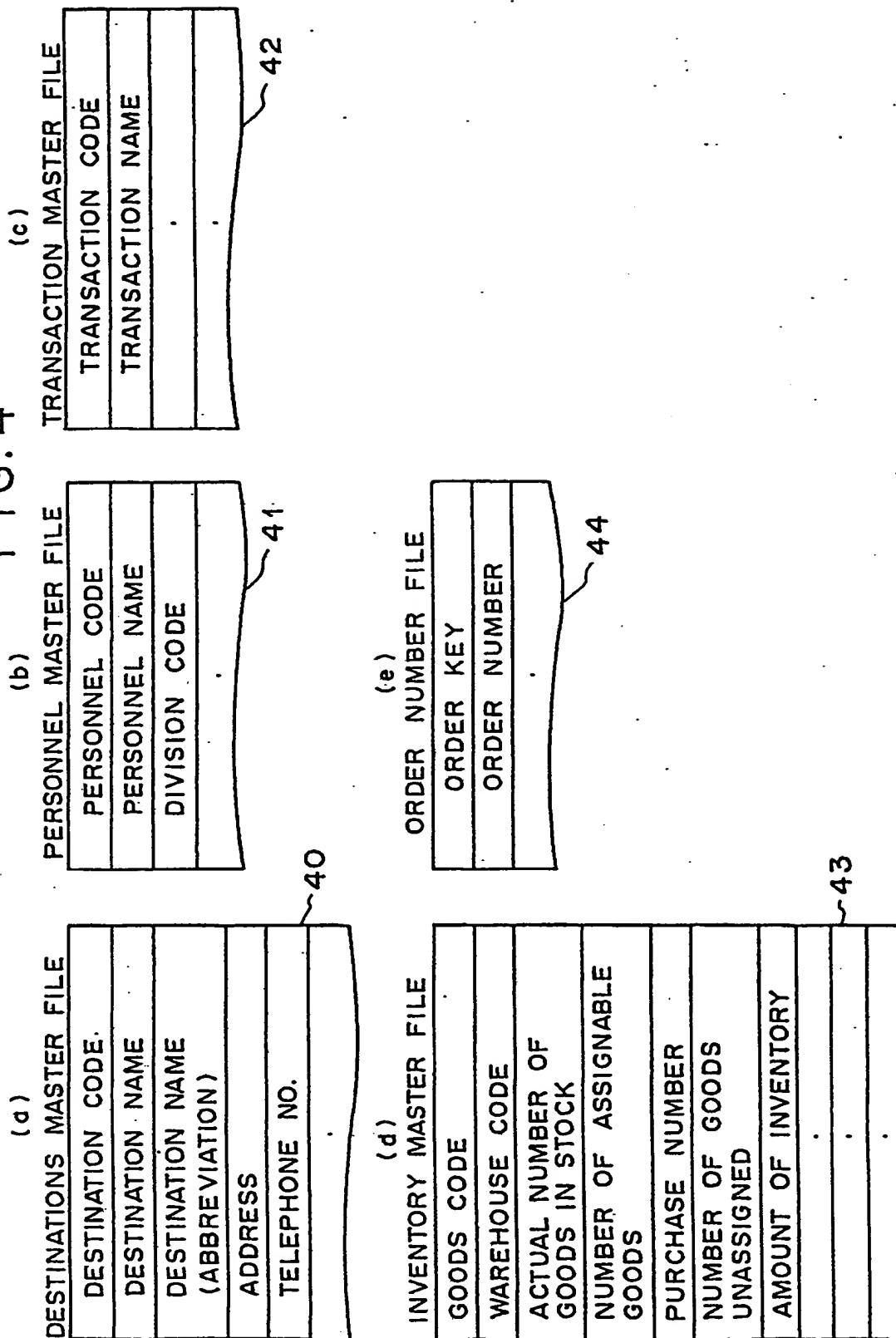
GOODS CODE
GOODS NAME (PROPER NAME)
GOODS NAME (ABBREVIATION)
GOODS NAME (KANA FORM)
STANDARDS
SALES UNIT PRICE
PURCHASE UNIT PRICE
STOCK TYPE
MINUS STOCK TYPE
COMBINATION GOODS TYPE

GOODS CODE (PARENT)
GOODS CODE (CHILD)
REQUIRED NUMBER OF ELEMENTS

CLIENT CODE
CLIENT NAME (PROPER NAME)
CLIENT NAME (ABBREVIATION)
ADDRESS
TELEPHONE NO.
DESTINATION CODE
BUSINESS PERSONNEL CODE
CLOSING DATE
BALANCE OF AMOUNT BILLED (UNTIL PREVIOUS SALE)
AMOUNT OF CURRENT SALE (PREVIOUS SALE)
CASH (PREVIOUS SALE)
BILL (PREVIOUS SALE)
TRANSFER (PREVIOUS SALE)
CHECK (PREVIOUS SALE)
OFFSET (PREVIOUS SALE)
BALANCE OF AMOUNT BILLED (UNTIL PRESENT SALE)
AMOUNT OF CURRENT SALE (PRESENT SALE)
CASH (PRESENT SALE)
BILL (PRESENT SALE)
TRANSFER (PRESENT SALE)
CHECK (PRESENT SALE)
OFFSET (PRESENT SALE)
PAYMENT CONDITION
ESTIMATED DATE OF PAYMENT
OUTSTANDING BILL ACCOUNT
AMOUNT OF SALES (LAST 12 MONTHS)
AMOUNT OF PAYMENT (LAST 12 MONTHS)
BALANCE (LAST 12 MONTHS)

4/25

FIG. 4



5/25

50 (a)  
ORDER FILE

FIG. 5

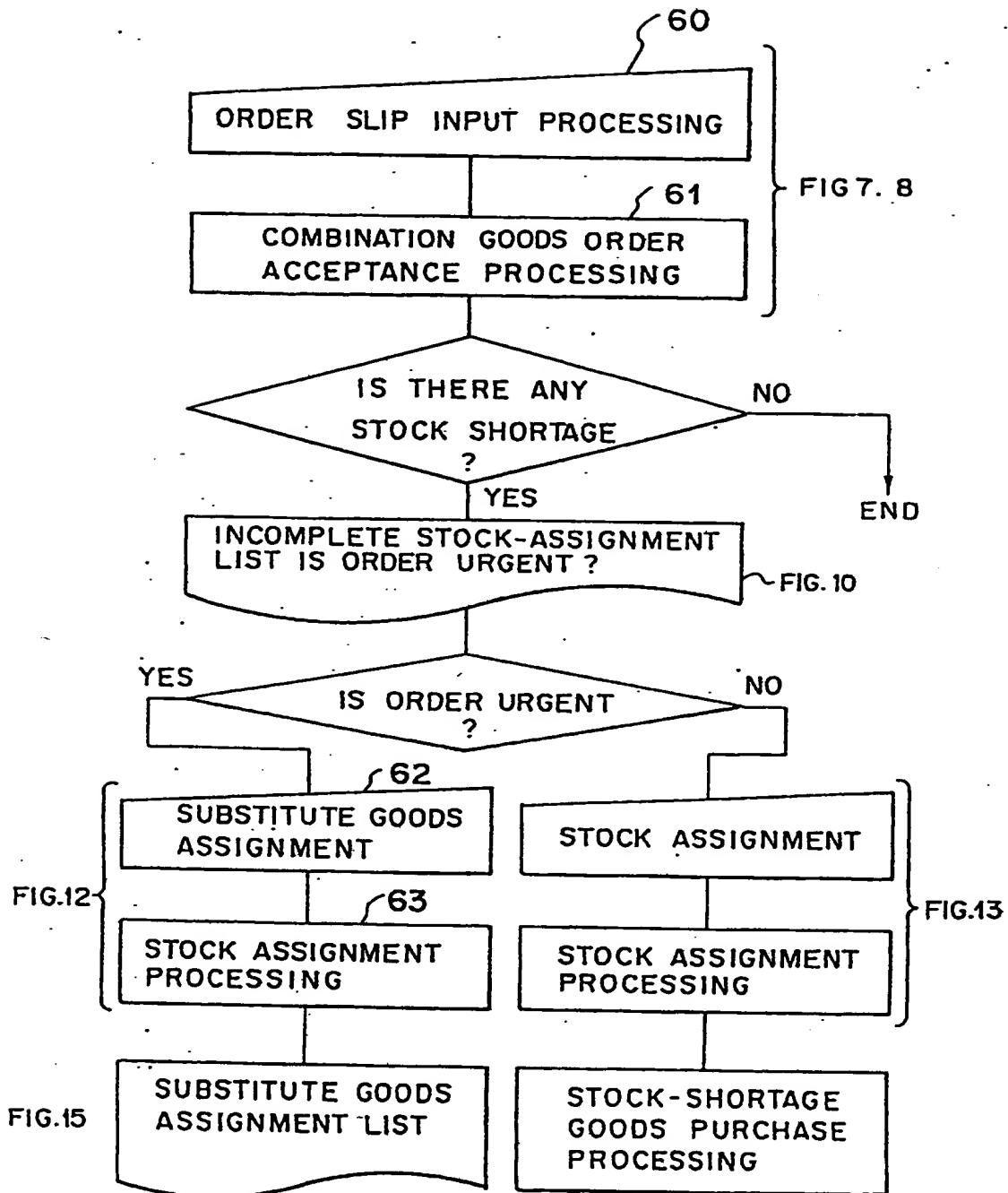
(b) 51  
PROCESS FILE

ORDER NO.
LINE NO.
ORDER TYPE
CLIENT CODE
CLIENT NAME
BUSINESS PERSONNEL CODE
BUSINESS PERSONNEL NAME
DESTINATION CODE
DESTINATION NAME
END USER
CLIENT'S ORDER NO.
DELIVERY TYPE
DELIVERY TYPE NAME
PROCESS NO.
DRAWING NO.
REFERENCE CODE
REFERENCE NAME
DESIGNATION
GOODS CODE
GOODS NAME (PROPER NAME)
QUANTITY OF ORDER
NUMBER OF GOODS UNASSIGNED
NUMBER OF GOODS ASSIGNED
SALES UNIT PRICE
ORDER UNIT PRICE
PURCHASE PRICE
APPOINTED DELIVERY DATE
SHIPMENT DATE
MINUS STOCK TYPE
COMBINATION GOODS TYPE
PURCHASE UNIT PRICE
STOCK TYPE
MINUS STOCK TYPE
COMBINATION GOODS TYPE

ORDER NO.
LINE NO.
CLIENT CODE
CLIENT NAME
APPOINTED DELIVERY DATE
GOODS CODE (PARENT)
GOODS NAME (PARENT)
NUMBER OF GOODS ORDERED (PARENT)
NUMBER OF GOODS ASSIGNED (PARENT)
NUMBER OF GOODS UNASSIGNED (PARENT)
GOODS CODE (CHILD)
GOODS NAME (CHILD)
NUMBER OF GOODS ASSIGNED (CHILD)
NUMBER OF GOODS UNASSIGNED (CHILD)
GOODS CODE (SUBSTITUTE GOODS)
GOODS NAME (SUBSTITUTE GOODS)
NUMBER OF GOODS ASSIGNED (SUBSTITUTE GOODS)

6/25

FIG. 6



7/25

FIG. 7

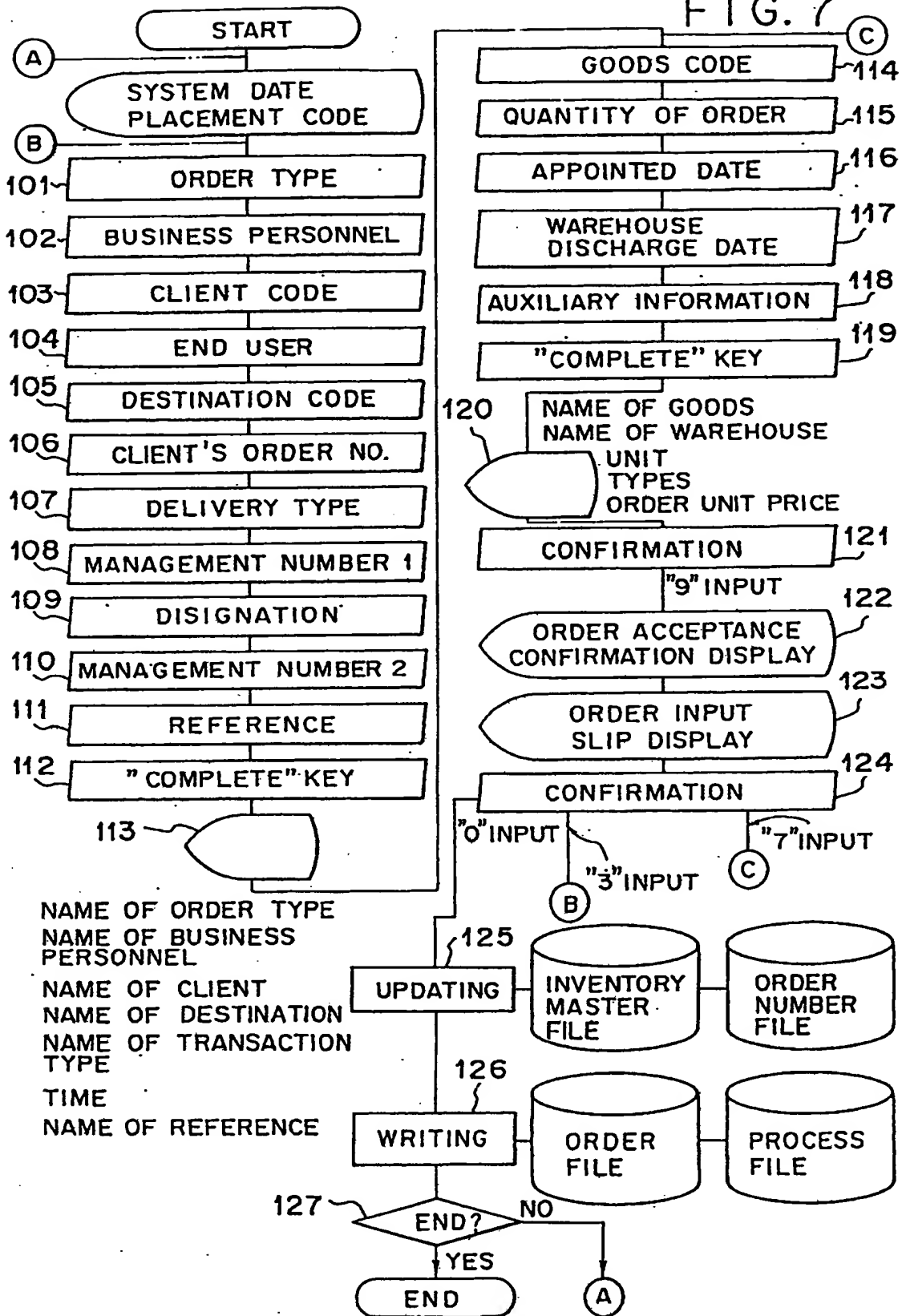




FIG. 8

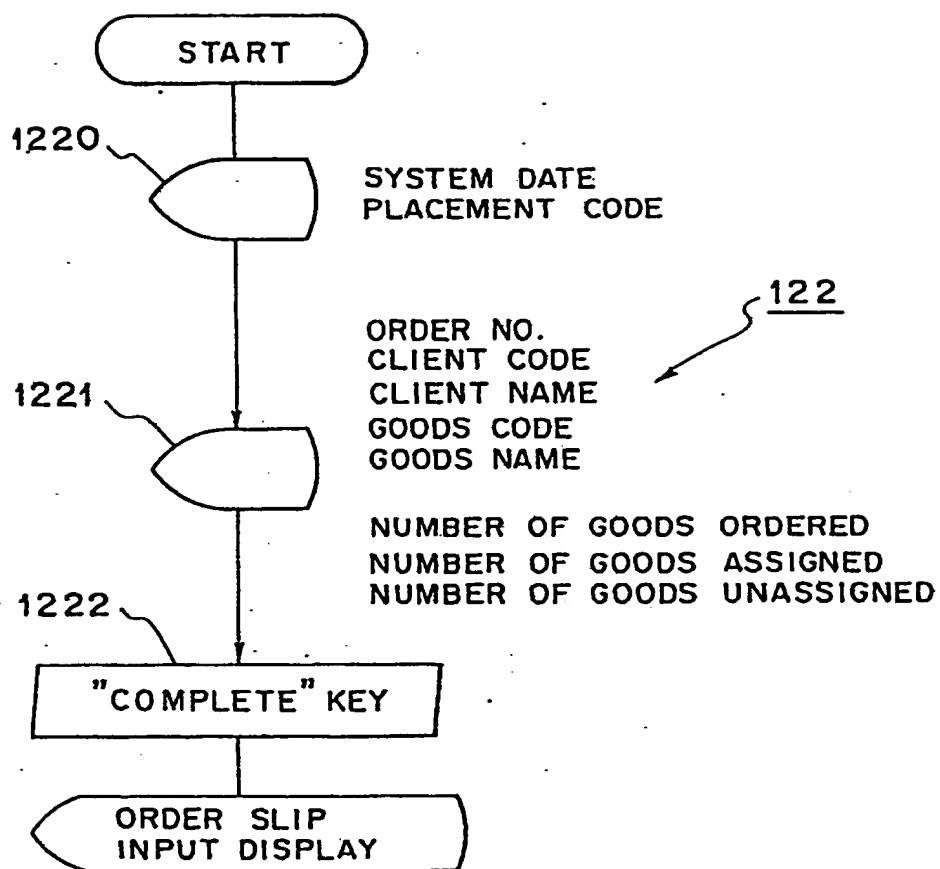
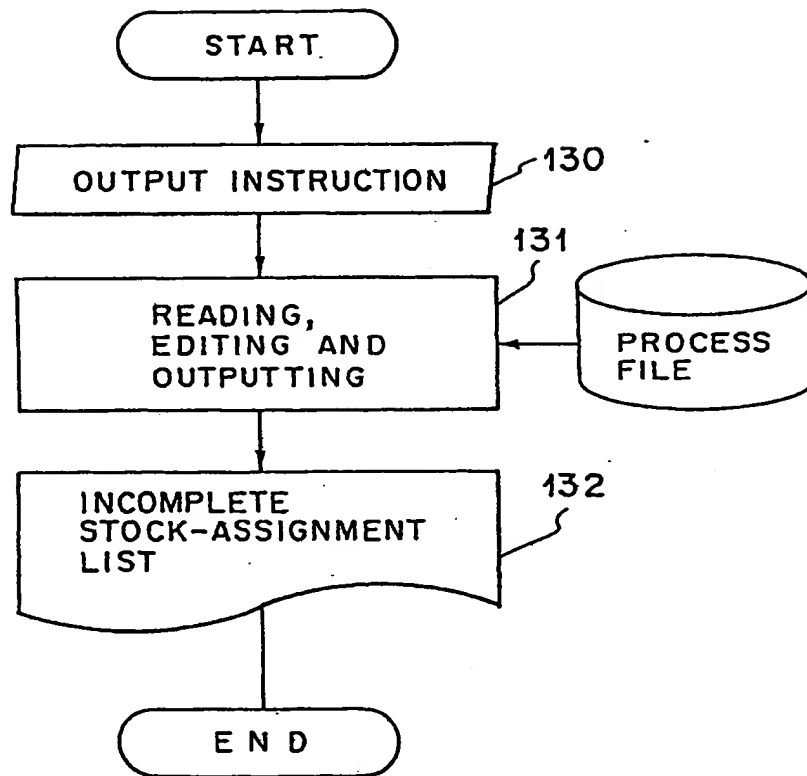




FIG. 10





12/25

FIG. 12

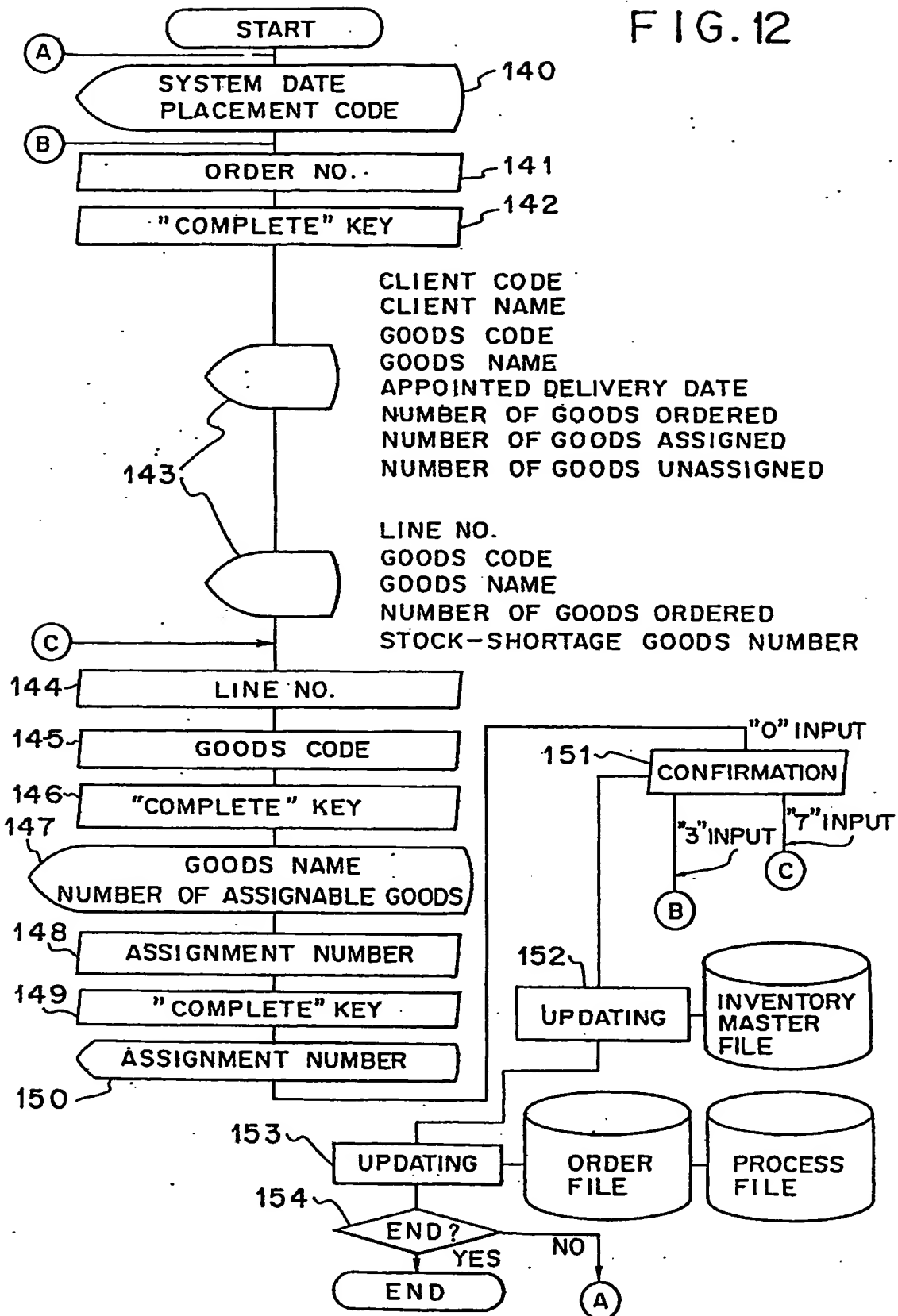
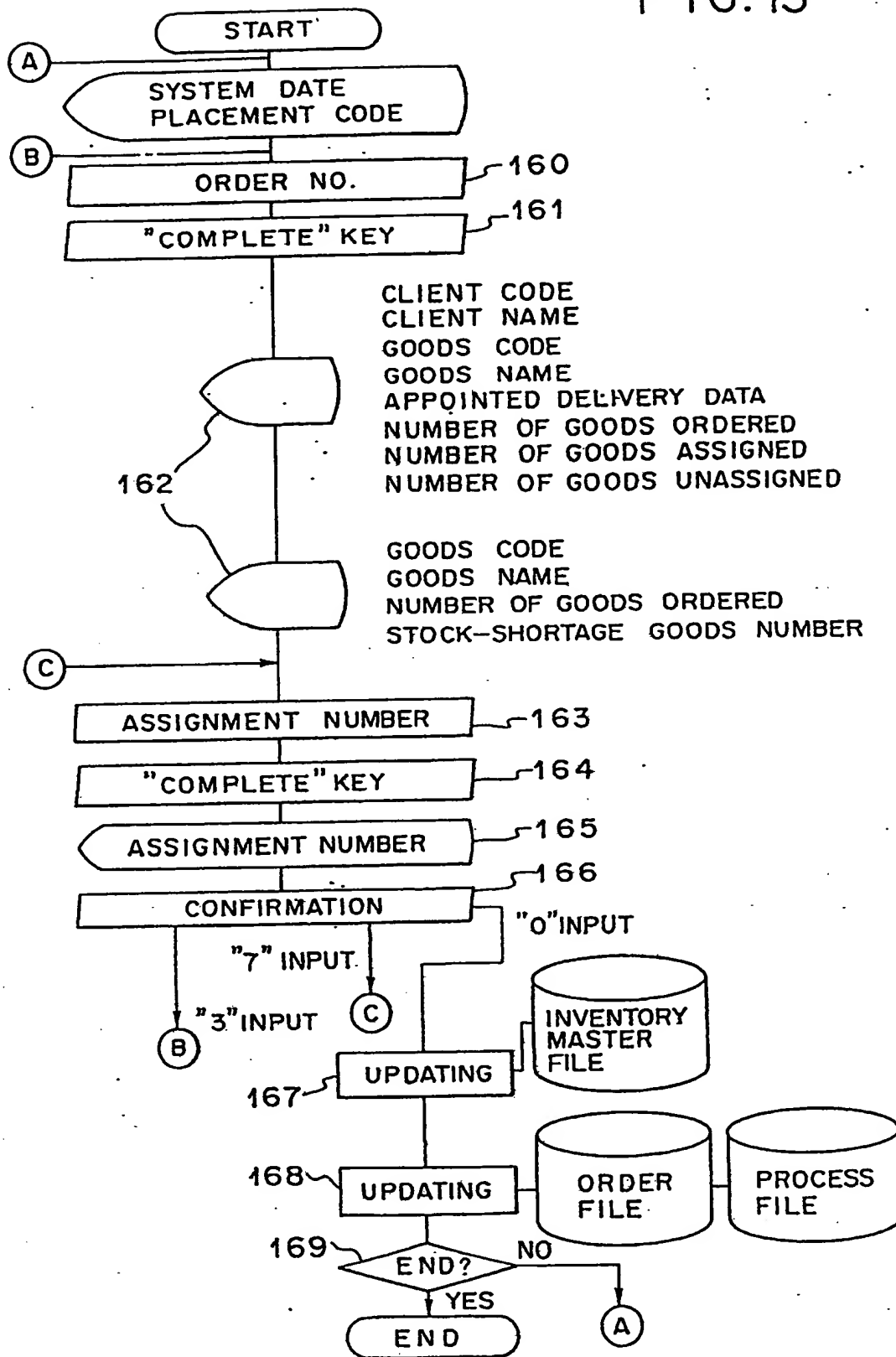


FIG. 13



# FIG.14

## (SUBSTITUTE GOODS ASSIGNMENT)

YEAR MONTH DAY  
88 88 88  
PLACEMENT... YYY

ORDER NO. 999999

CLIENT YYYYYY K K K K K K K K K

GOODS YYYYYYYYYY K K K K K K K K K

NUMBER OF GOODS ORDERED: 88, 888

STOCK-SHORTAGE GOODS

APPOINTED DATE : 888888  
NUMBER OF GOODS UNASSIGNED: 88, 888

LINE	GOODS CODE	GOODS NAME	NUMBER OF GOODS ORDERED	NUMBER OF GOODS UNASSIGNED
YY	YYYYYYYY	K K K K K K K K K	88, 888	8, 888
YY	YYYYYYYY	K K K K K K K K K	88, 888	8, 888
YY	YYYYYYYY	K K K K K K K K K	88, 888	8, 888
YY	YYYYYYYY	K K K K K K K K K	88, 888	8, 888
YY	YYYYYYYY	K K K K K K K K K	88, 888	8, 888

### SUBSTITUTE GOODS

LINE	GOODS CODE	GOODS NAME	NUMBER OF ASSIGNABLE GOODS	ASSIGNMENT NUMBER
XX	XXXXXXXX	K K K K K K K K K	88, 888	99, 999
XX	XXXXXXXX	K K K K K K K K K	88, 888	99, 999
XX	XXXXXXXX	K K K K K K K K K	88, 888	99, 999
XX	XXXXXXXX	K K K K K K K K K	88, 888	99, 999
XX	XXXXXXXX	K K K K K K K K K	88, 888	99, 999

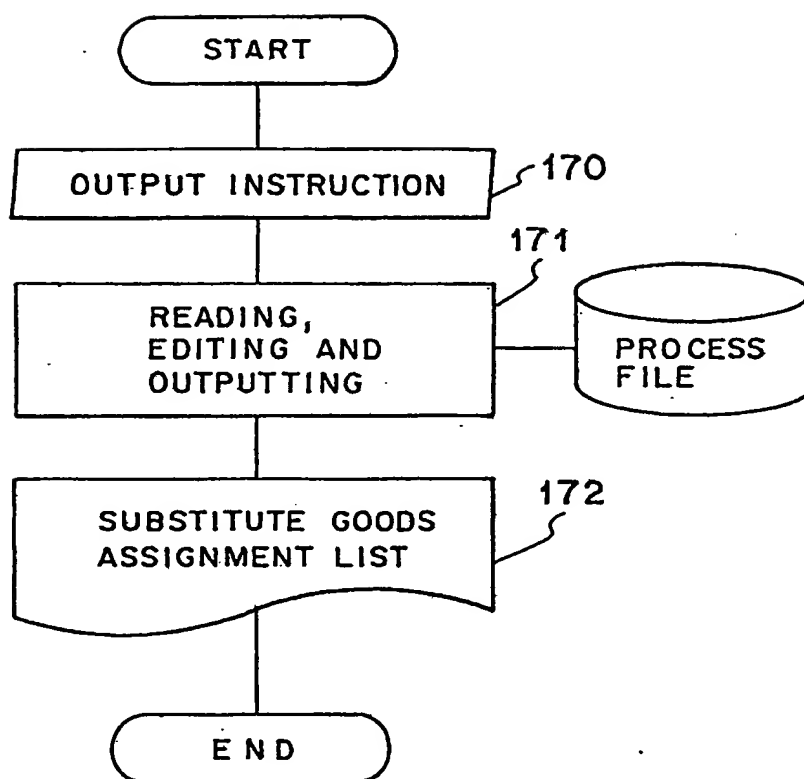
CONFIRMATION ... (X)

- 9: ITEM FOR NUMERIC INPUT
- 8: ITEM FOR NUMERIC OUTPUT
- X: ITEM FOR ALPHANUMERIC/KANA INPUT
- Y: ITEM FOR ALPHANUMERIC/KANA OUTPUT

- N: ITEM FOR KANJI INPUT
- K: ITEM FOR KANJI OUTPUT

14/25

FIG.15





4-6-16

YEAR MONTH DAY  
DATE: 99 99 99 P. 99

**ORDERED GOODS (COMBINATION GOODS)**

ORDER NO.	CLIENT CODE	CLIENT NAME	NUMBER OF GOODS UNASSIGNED
LINE NO.	GOODS CODE	GOODS NAME	
999999	XXXXXX	KKKKKKKK	
99	XXXXXXXXXX	KKKKKKKK	Z. ZZZ

[illegible]



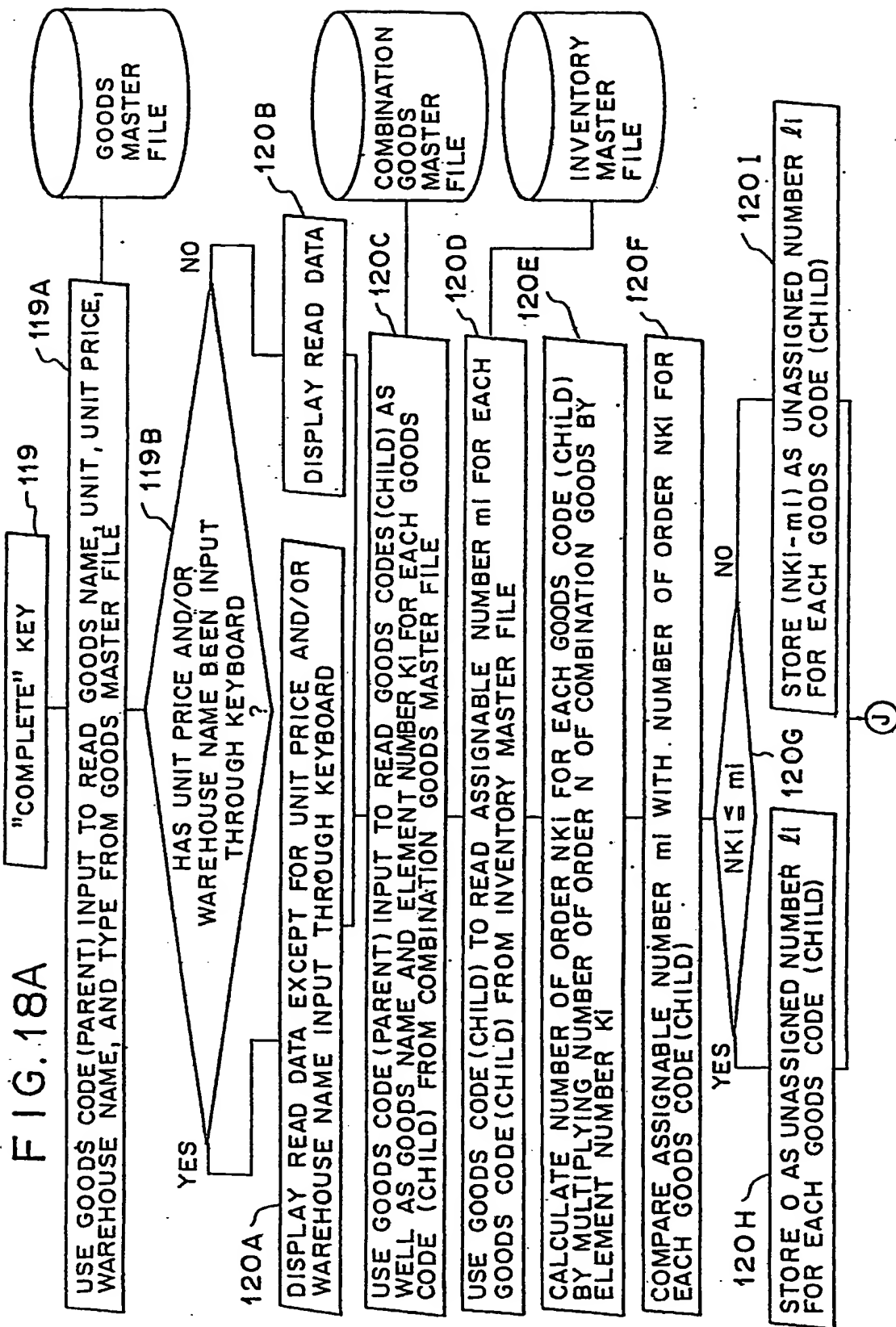


FIG. 18B

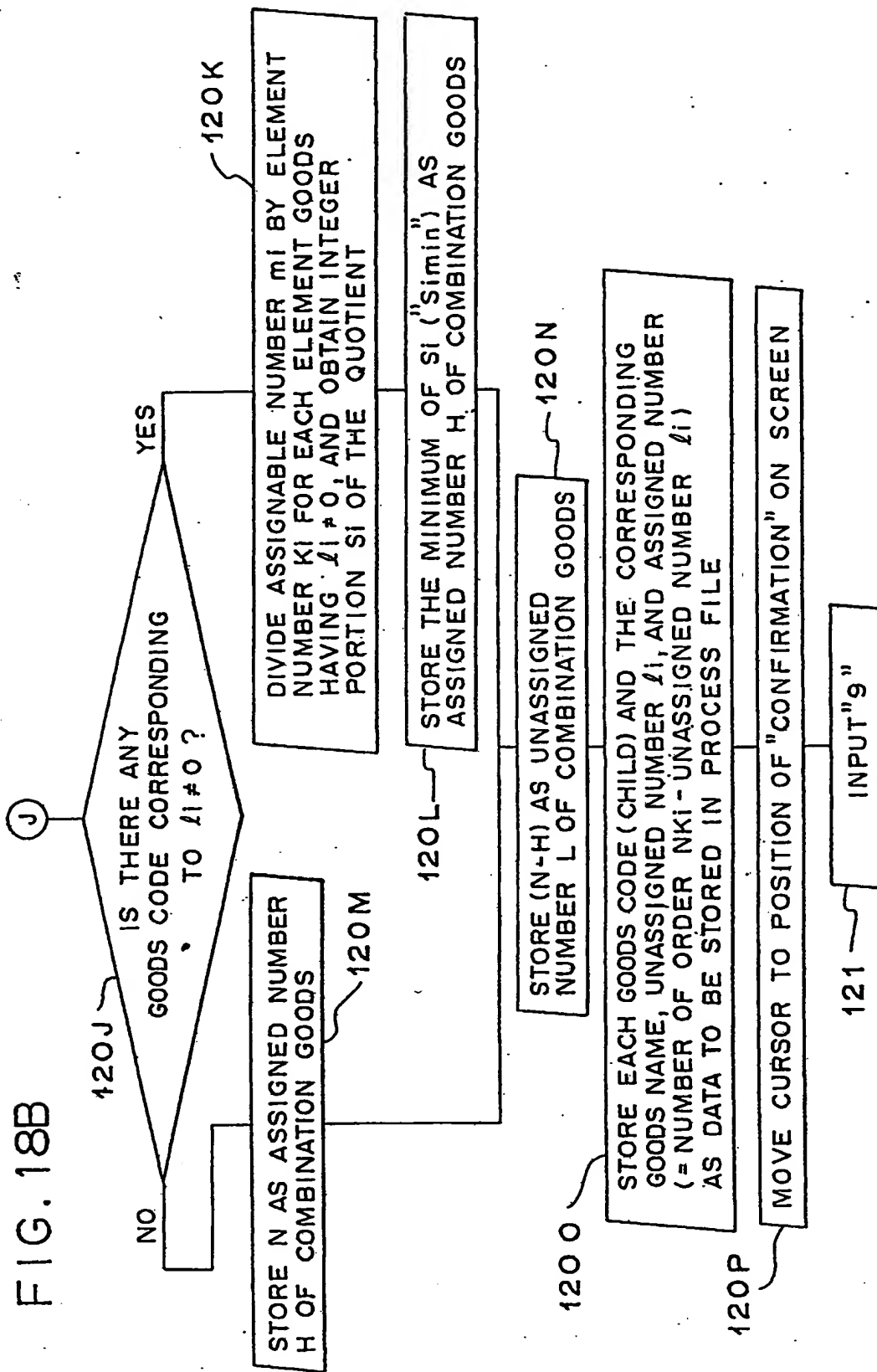
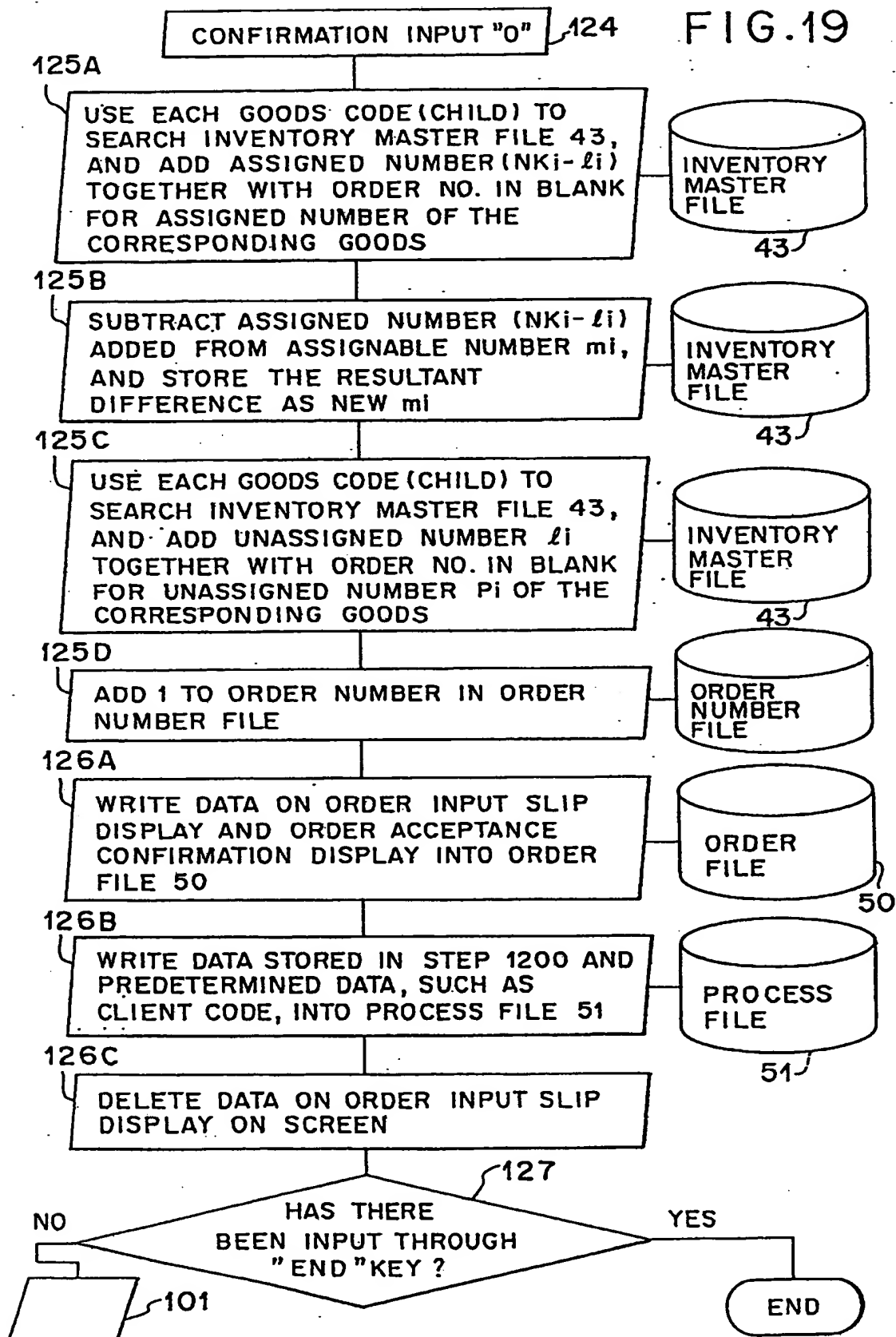


FIG. 19



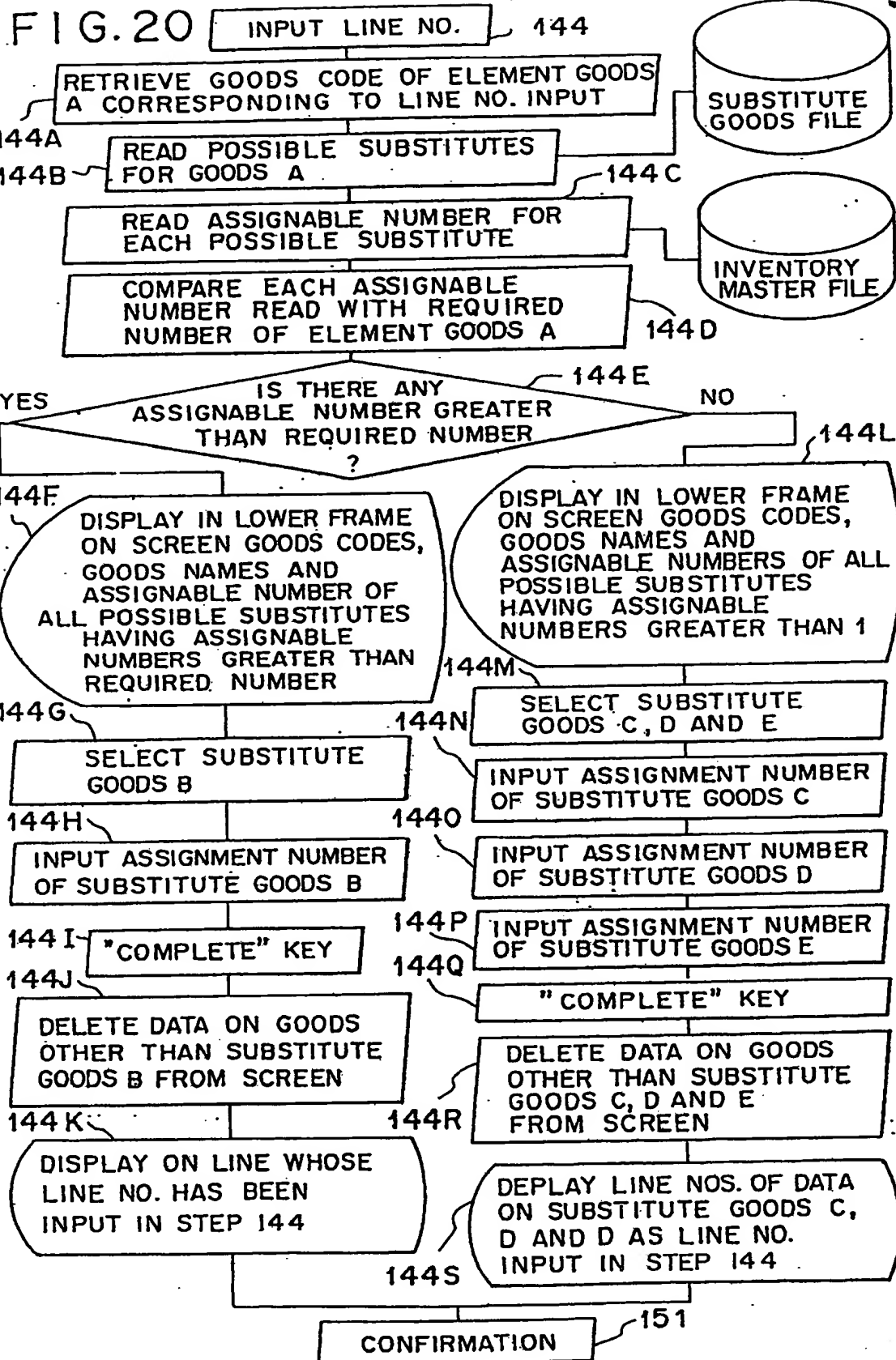


FIG. 21A

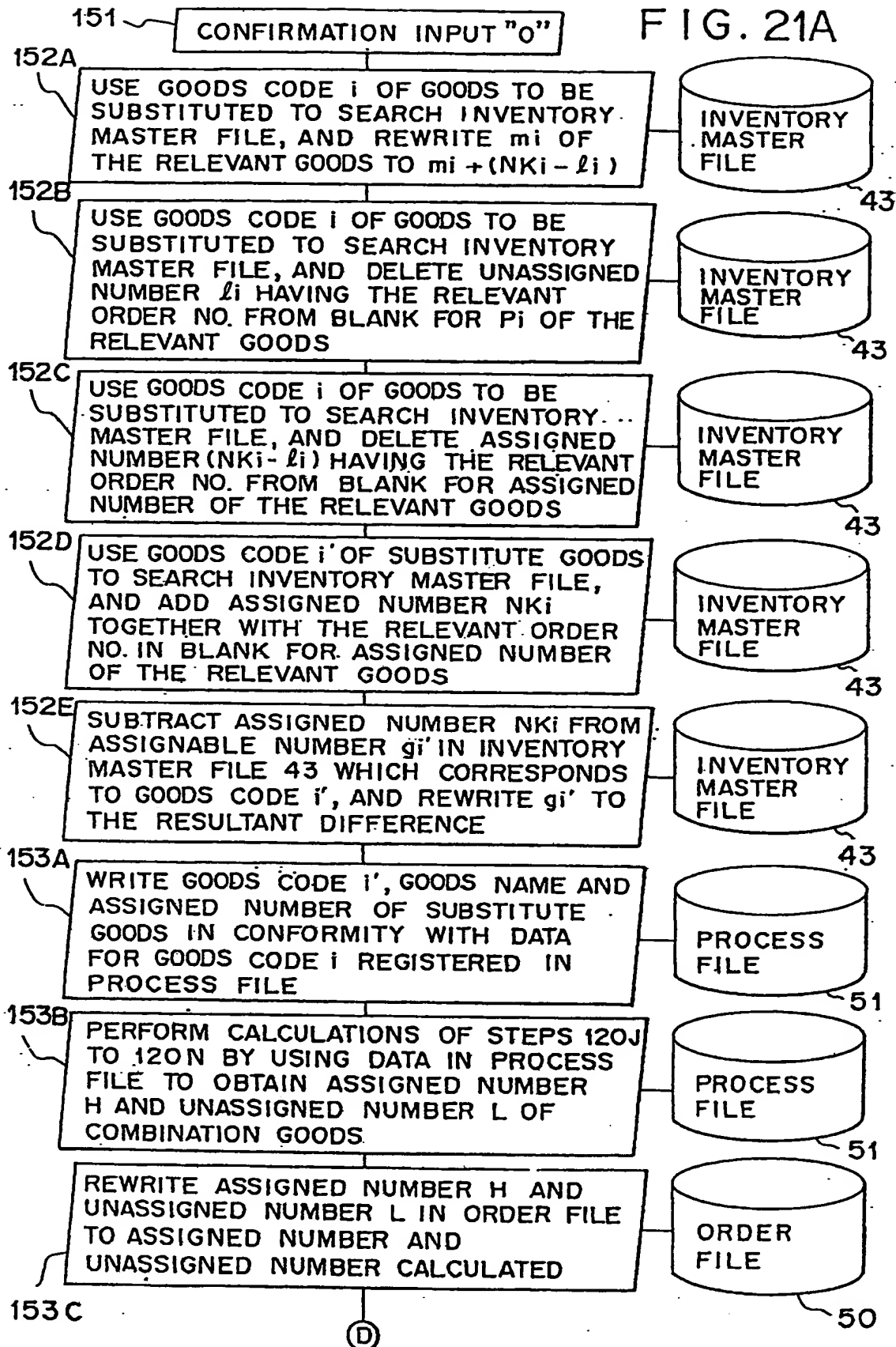


FIG. 21B

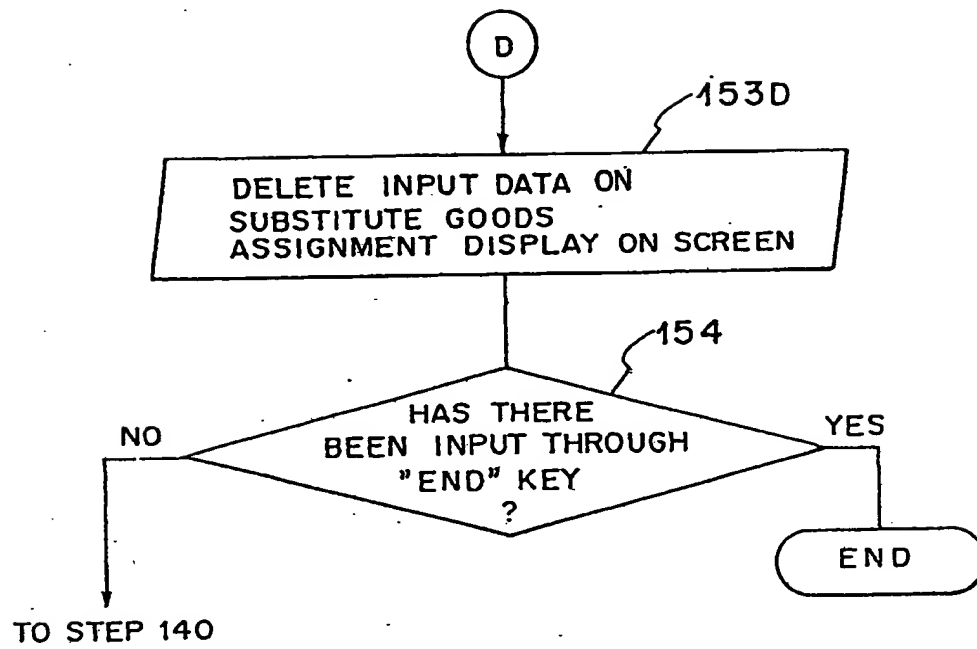




FIG. 22A

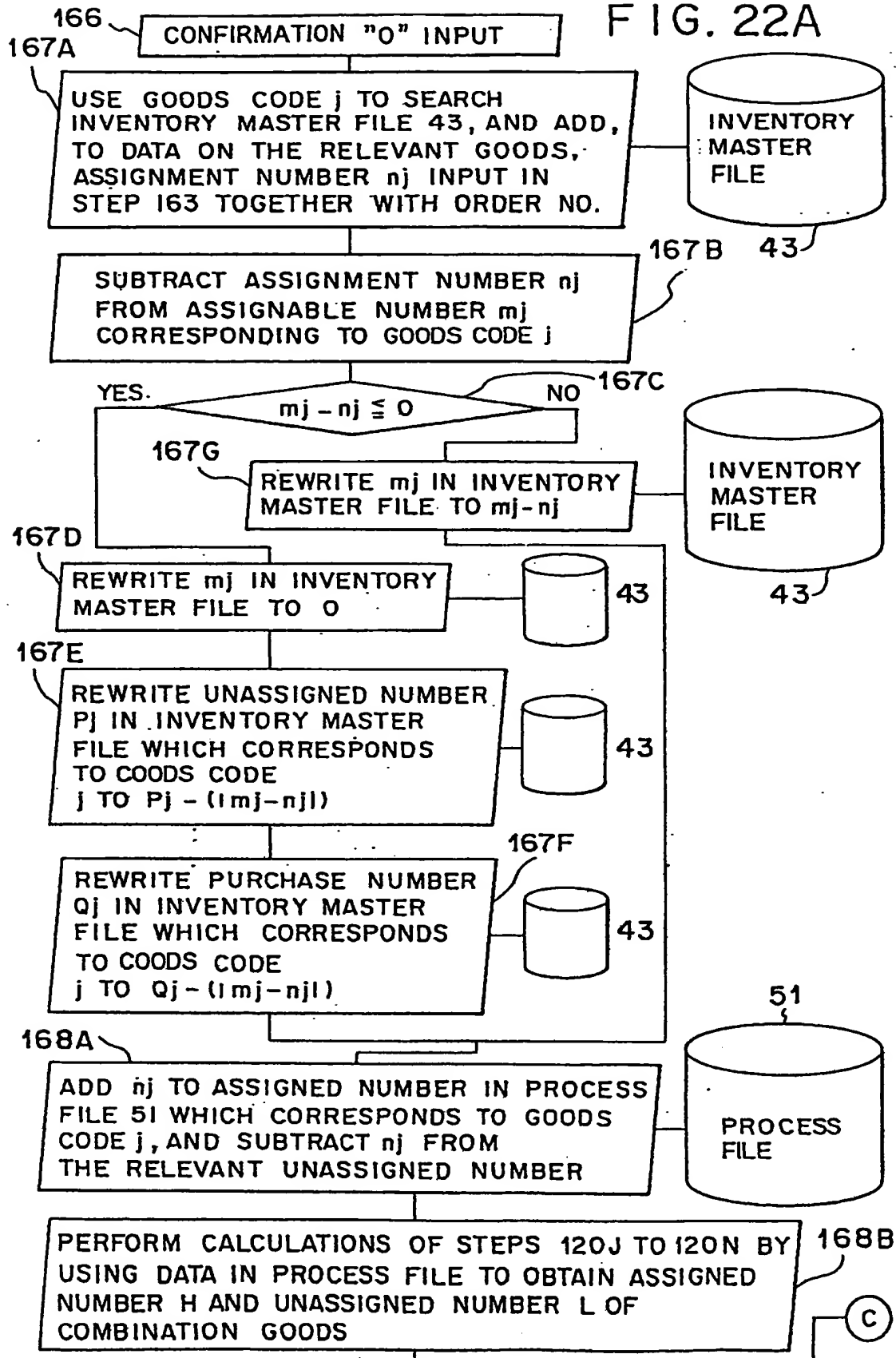
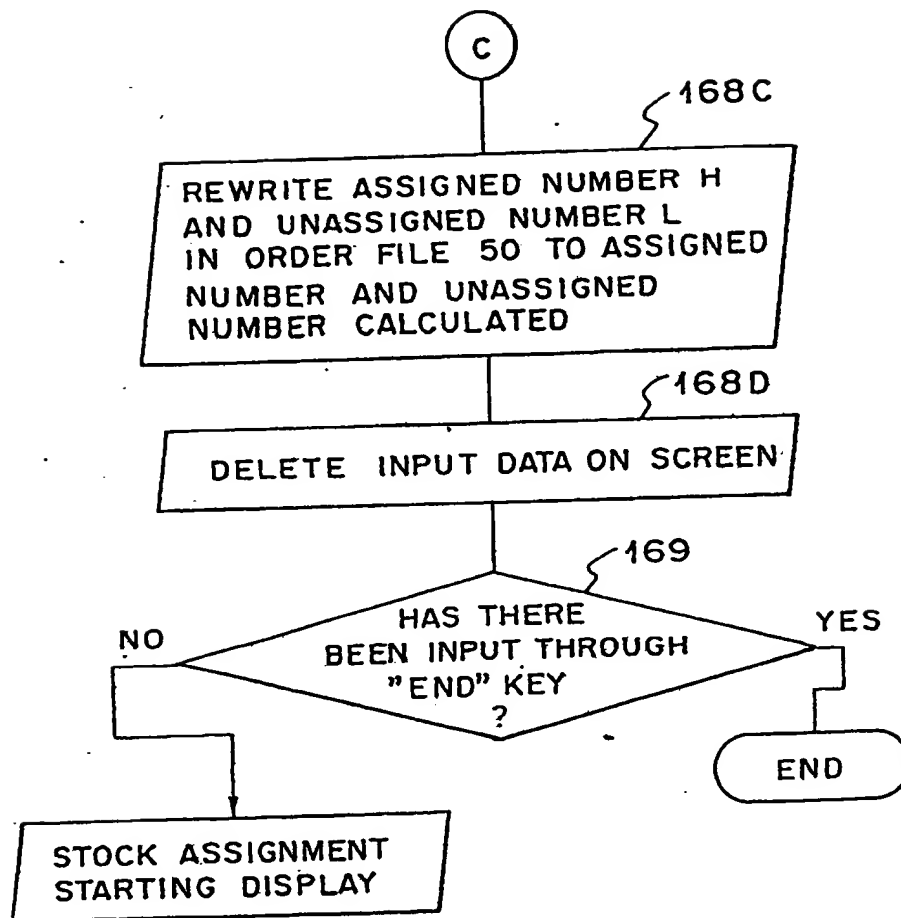


FIG. 22B



INVENTORY MANAGEMENT APPARATUS AND METHOD  
FOR COMBINATION GOODS

The present invention relates to an apparatus and a method for inventory management of individual goods (element goods) constituting combination goods referred to as "set goods" or "kit goods" in wholesale business.

As order management in wholesale business has come to be processed with computers, the use of computer systems in order management and inventory management of combination goods as well has been introduced in part of the practice. However, conventional order processing and inventory management systems have not been able to provide satisfactory functions and be easily usable. For instance, the order management module and the inventory management module of "HISALS", an application program offered by Hitachi, Ltd., are not constructed to handle combination goods. With this program, therefore, inventory management is performed with respect to individual goods even when goods which can be sold as single items have been ordered for sale as elements of combination goods, and accordingly, it is necessary to perform inventory management of combination goods and that of single-sale goods in an interlocking manner.

An example of processing performed in such cases is as

follows: when there has been an order for combination goods X comprising, e.g., good A, good B, good C, good D and good E (the term "good" referring to an item of goods), a certain number of each good A to E sufficient for filling the order are subtracted from the number of stock of each good A to E registered in an inventory master file, and the thus prepared combination(s) are shipped as combination goods X.

Thus, although it is not totally impossible to manage orders for combination goods and their inventory with the above art, operations required are inevitably complicated because each of individual goods (i.e., child goods) constituting combination goods (i.e., a parent good) has to be independently transferred from the inventory master file.

When there have been alterations and abolitions of combination goods, the processing of orders and the management of inventory for combination goods require proper knowledge of the relevant combination goods, and thus, have to be performed only by those persons having substantial knowledge of the goods.

Another problem is that, since inventory management is performed by individual goods, it is totally impossible to judge whether or not there is an inventory shortage of combination goods. As a result, assignment processing cannot be immediately performed in an interlocking manner.

An object of the present invention is to provide an inventory management apparatus for combination goods that allows inventory management of combination goods to be performed easily even by a person having no knowledge of merchandise, and allows suitable assignment processing to be immediately performed in an interlocking manner when there is an inventory shortage.

In order to achieve the above object, according to the present invention, there is provided an inventory management apparatus for combination goods, comprising: a goods master file storing information on goods handled at least including information on whether each good is for sale as a single item or for sale as combination goods comprising a combination of a plurality of items; a combination goods master file storing information on element goods constituting each combination of combination goods and an element number indicating the number of element goods in each combination; an inventory master file storing the numbers of stock of goods handled; an input device for inputting information on ordered goods and a quantity of order; and a processing device for checking the goods master file to determine whether or not ordered goods input from the input device are combination goods comprising a combination of a plurality of items, the processing device being capable, when the ordered goods are combination goods,

of retrieving from the combination goods master file both element goods constituting the combination goods and an element number of the element goods, and of checking the inventory master file to determine whether or not there is a sufficient number of the element goods in stock for filling the quantity of order, the processing device performing, when there is a sufficient number of the element goods in stock for filling the quantity of order, a stock assignment process and an updating process in which a number of assignment is subtracted from the number of stock of the element goods stored in the inventory master file, the processing device performing, when there is not a sufficient number of the element goods in stock for filling the quantity of order, either a process for purchasing a required number of the element goods or a process for assigning substitute goods.

In the above-stated construction, the processing device checks the goods master file to determine whether or not ordered goods are combination goods. When the ordered goods are combination goods, the processing device retrieves from the combination goods master file both element goods constituting the combination goods and an element number of the element goods, and checks the inventory master file to determine whether or not there is a sufficient number of the element goods in stock for filling the quantity of order.

When there is a sufficient number of the element goods in stock for filling the quantity of order, the processing device performs a stock assignment process and an updating process in which a number of assignment is subtracted from the number of stock of the element goods stored in the inventory master file. When there is not a sufficient number of the element goods in stock for filling the quantity of order, the processing device performs either a process for purchasing a required number of the element goods or a process for assigning substitute goods. Thus, it is possible for inventory management of combination goods to be performed easily even by a person having no knowledge of merchandise, and, when there is an inventory shortage, it is possible to immediately perform suitable assignment processing in an interlocking manner.

Embodiments in which the present invention is applied to inventory management of combination goods in general wholesale business will be described in detail with reference to the accompanying drawings, in which

Fig. 1 is a block diagram showing the hardware configuration of an embodiment of an inventory management apparatus for combination goods according to the present invention;

Fig. 2 is a view showing an example of an order slip

input display for inputting data on ordered goods;

Figs. 3(a) to 3(c) are views showing examples of various master files in a hard disk;

Figs. 4(a) to 4(e) are views showing examples of other master files and a file in the hard disk;

Figs. 5(a) and 5(b) are views showing examples of data files in the hard disk;

Fig. 6 is an explanatory view showing the relationship between various inputs and outputs concerning ordered goods;

Fig. 7 is a flowchart showing an example of a processing for inputting an order for combination goods;

Fig. 8 is a flowchart showing examples of procedures for checking the status of stock-assignment;

Fig. 9 is a view showing an example of a display for confirming stock-assignment;

Fig. 10 is a flowchart showing examples of procedures for preparing an incomplete stock-assignment list;

Fig. 11 is a view showing an example of a format of an incomplete stock-assignment list;

Fig. 12 is a flowchart showing examples of procedures for assigning substitute goods;

Fig. 13 is a flowchart showing examples of procedures for assigning goods through purchase when the goods have a stock shortage;

Fig. 14 is a view showing an example of a display



during substitute goods assignment;

Fig. 15 is a flowchart for showing examples of procedures for preparing a substitute goods assignment list;

Fig. 16 is a view showing an example of a format of a substitute goods assignment list;

Fig. 17 is an explanatory view showing an example of a display during stock assignment;

Fig. 18 is a view showing details of a part of the flowchart shown in Fig. 7;

Fig. 19 is a view showing details of another part of the flowchart shown in Fig. 7;

Fig. 20 is a view showing a variation of a part of the flowchart shown in Fig. 12;

Fig. 21 is a view showing details of a part of the flowchart shown in Fig. 12; and

Fig. 22 is a view showing details of a part of the flowchart shown in Fig. 13.

#### (1) Hardware Configuration of System

Fig. 1 shows the hardware configuration of an inventory management apparatus for combination goods, to which the present invention is applied. The illustrated apparatus includes a central processing unit (hereinafter referred to as "CPU") 1 for performing various processings to manage orders, inventory and stock assignment, a hard disk 2 for

storing various files storing data necessary to management operations, a keyboard 3 through which data such as names of goods and numbers or quantities of goods can be input during acceptance of an order and through which instructions to retrieve and output data on incomplete stock-assignment can be input, a display 4 for displaying input data, retrieved data, etc., and a printer 5 for outputting input data on forms or the like.

The CPU 1 stores general management programs and operation programs, both previously stored therein. The operation programs have the following basic construction: when a certain quantity of goods has been ordered, whether the ordered goods are combination goods or not is determined by checking a goods master file; when the ordered goods are combination goods, both the element goods (child goods) constituting the combination goods (parent good) and the number of the element goods in each combination are retrieved from a combination goods master file; an inventory master file is used to check whether there is a sufficient amount of stock of the element goods for filling the quantity of order; when there is such a sufficient amount of stock of the element goods, a stock assignment processing is performed and, also, an updating processing is performed in which a number of assignment is subtracted from the number of stock of the element goods stored in the inventory master

file; and when there is not a sufficient amount of stock of the element goods, that is, the element goods have a stock shortage, either a procedure for purchasing a required number of the element goods or a procedure for assigning substitute goods is performed.

The hard disk 2 stores therein various files and data files previously prepared. The files include a goods master file 30, a combination goods master file 31, a client master file 32, a destination master file 40, a personnel master file 41, a transaction master file 42, an inventory master file 43, an order number file 44, a reference master file 45, and various data files. The data files include an order file 50 which stores input data on ordered combination goods, and a process file 51 which is prepared when a stock shortage has occurred.

The goods master file 30 stores data on goods handled by the company, the data at least including whether each good is for sale as a single item or for sale as combination goods comprising a combination of a plurality of items. The combination goods master file 31 stores data on combination goods, the data at least including element goods constituting each combination and the number (element number) of the element goods in the combination. The inventory master file 43 stores data on the amounts of stock of all the goods handled.

The order file 50 stores data on certain combination goods input through the keyboard 3 with reference to an order input slip display concerning combination goods and displayed on the screen of the display 4. The process file 51 stores data on goods having stock shortages.

With the inventory management apparatus having the above construction, the processing of an order is started by inputting various data on an order input slip, which may be followed by assigning goods in stock. When there is a stock shortage, either a purchase procedure or a substitute-goods assignment procedure is performed.

An order input slip for inputting an order will be described first.

## (2) Order Input Slip

With the inventory management apparatus of this embodiment, data necessary to the management of orders, inventory, and stock assignment are input by using suitable forms or order input slips. An order input slip can be either a form or an image displayed by the display 4.

Fig. 2 shows an example of an order input slip 20 as an image displayed on the screen of the display 4. Such an order input slip 20 is prepared when an order has been received from a client, and data contained in the slip 20 is stored in an order file 50.

An order input slip 20 has blanks to be filled with,

i.e., for inputting, items such as an order type, business personnel in charge, a client, a destination, an end user, a client's order No., a delivery type, a management number 1, a management number 2, reference, and designation (designation of delivery time).

Item "order type" indicates the type of the relevant order, which is input as a corresponding order type code such as "100 = sales on credit", "101 = sales on cash", "102 = direct-sending sales-on-credit", "101 = direct-sending sales-on-cash", "200 = sales-on-credit return" or "201 = sales-on-cash return".

Item "business personnel" indicates the personnel in charge of the client who has placed the order and the personnel in charge of various data recorded on the order input slip 20.

Item "destination" indicates the name of a company (agent or the like) which is other than the client and to which the ordered goods should actually be delivered.

Item "end user" indicates the end user who is to actually use the goods after their delivery to the client or the destination.

Item "client's order No." indicates an order No. specified by the client when the order has been received.

Item "delivery type" indicates the type of delivery, which is input as a corresponding delivery type code such as

"1 = transportation by the company", "2 = transportation by an agent", or "3 = transportation by the client".

Items "management number 1" and "management number 2" indicate numbers used in a process for working or producing goods when the goods ordered by the client are not standard goods but special goods requiring a working or producing process.

Item "reference" indicates auxiliary information when there is conditions or the like of the order received.

Item "designation" indicates a time division of the day within which the ordered goods should be delivered to the client or destination, and is input as a time code corresponding to the designated time, such as "1 = no designation", "2 = morning" or "3 = afternoon".

Item "client" indicates the client, which is usually input as a corresponding client code.

In the embodiment shown in Fig. 1, necessary data are input in the order input slip 20 on the screen of the display 4 in the following manner: when appropriate codes indicating the order type, the business personnel, the client and the destination are input, corresponding names of the order type, the business personnel, the client and the destination are automatically displayed by the CPU 1 on the screen of the display 4. Regarding item "reference", when an appropriate code is input, details of certain

reference are automatically displayed on the screen.

However, it is possible to input any desired data.

Regarding item "designation", until there is a code input, the code "1" (= no designation) is automatically set as the initial value, and time divisions can be automatically displayed. However, when a designation code has been input, a time division corresponding to the input code is displayed.

A lower frame of the order input slip 20 has blanks for a goods code, a goods name, a quantity of order, a unit, an order unit price, a warehouse, an appointed delivery date, a warehouse discharge date, auxiliary information, and a type. These blanks are for items of data which are needed mainly by the management of orders and inventory, and which concern the handling of goods in wholesale business. In the illustrated example, three-line blanks are provided so that it is possible to input data on three different combinations of combination goods (i.e., three different parent goods). However, it is possible to make data on any desired number of combinations input.

Data filling the blanks for "goods name" and "unit" are automatically displayed when a goods code has been input, and need not be input through the keyboard 3.

Data filling the blank for "order unit price" is also automatically displayed after the goods-code inputting.

However, it is also possible to input pertinent data through the keyboard 3. In this case, priority is given to the data input through the keyboard 3.

Data filling the blanks for "warehouse" is also automatically displayed after the goods-code inputting. However, it is also possible to input pertinent data through the keyboard 3, and in this case, priority is given to the data input through the keyboard 3.

Items "appointed delivery date" and "warehouse discharge date" respectively indicate the appointed date at which the ordered goods should be delivered to the client or destination, and the expected date of shipment from the warehouse. Data for these items are input through the keyboard 3.

Item "auxiliary information" indicates auxiliary information on goods, which is input through the keyboard 3.

Item "type" is provided to indicate, when any of element goods constituting a combination of combination goods has a stock shortage, the fact that stock assignment is incomplete by indicating "incomplete".

Next, various master files will be described.

### (3) Master Files

Figs. 3(a) to 3(c) show examples of a goods master file 30, a combination goods master file 31 and a client master file 32, respectively, all prepared in the hard disk 2.



A goods master file 30, shown in Fig. 3(a), stores data necessary to the inventory management of all multiplicity of goods, or component parts, handled by the company, the data being stored in correspondence with each of goods codes. Data corresponding to each good code include: displaying and printing data comprising data on a good name (in the forms of kanji, kanji abbreviation, and kana); and other data comprising data on standards, a sales unit price, a purchase unit price, a stock type, a minus stock type, and a combination goods type. The combination goods type indicates whether the relevant good is combination goods or not.

A combination goods master file 31, shown in Fig. 3(b), stores data on the composition of goods, or component parts, belonging to each parent good comprising combination goods, which data comprise a goods code (parent) indicating each parent good, a goods code (child) indicating child goods belonging to each combination (these codes will be referred to as "parent code" and "child code", respectively, unless otherwise described), and the number (element number) of child goods required to compose each combination of combination goods. The child code is used to retrieve data from an inventory master file 43.

A client master file 32, shown in Fig. 3(c) concerns clients, and stores data on the name, the address, the

telephone No., the business personnel of each client. The client master file 32 is constructed to store information on trade accounts receivable, such as data on the closing date (for enabling a bill to be issued before the closing date of each client), and data on the present and the previous sales (i.e., the balance of amount billed, the amount of current sale, and the amount of payment for each of the sales with items for the amount of payment including "cash", "bill", "transfer", "check" and "offset"). Further, the client master file 32 stores data on payment condition, an estimated date of payment, and an outstanding bill account. After processings for a closing date have been completed, data stored under items of the present sale are moved to fill the blanks for items of the previous sale, and data in the blanks for items of the present sale are returned to initial values. Furthermore, the client master file 32 stores certain information on sales, that is, the amount of sales, the amount of payment and the balance, all concerning the last 12 months.

The client master file 32 allows the data on amounts of money stored under items "amount of current sale (present sale)" and "amount of sales" to be updated each time data on an order are input by using an order input slip 20.

A destination master file 40, shown in Fig. 4(a) stores data for displaying or printing the name, the address, etc.

of each of a plurality of destinations, the data being stored in correspondence with each of a plurality of destination codes.

A personnel master file 41, shown in Fig. 4(b), stores names of business personnel in correspondence with each of business personnel code.

A transaction master file 42, shown in Fig. 4(c), stores conditions of the delivery of goods to a client or destination and, specifically, stores a delivery type name and delivery conditions in correspondence with each of a transaction codes.

An inventory master file 43, shown in Fig. 4(d) stores stock-amount information necessary to the inventory management of a multiplicity of goods, or component parts, in correspondence with each of goods codes. Data corresponding to each goods code include a warehouse code, an actual number of goods in stock, a number of assignable goods, a purchase number, a number of goods unassigned, and an amount of inventory. The inventory master file 43 is referred to on the basis of a child code stored in the combination goods master file 31 each time data on an order are input by using an order input slip 20, and the number of assignable goods stored in the inventory master file 43 is decreased by a number of element goods assigned. A number of goods assigned is stored in correspondence with an order

No., described in the following paragraph. When a stock shortage occurs in the above-described process, a number indicating the amount of the shortage is added to the stored number of goods unassigned, and the indication "incomplete" is displayed in the blank for item "type" of the order input slip 20 displayed by the display 4. Also, in this case, a process file 51 is prepared in the hard disk 2.

An order number file 44, shown in Fig. 4(e), stores an order number for automatically setting the order number on each order input slip.

Although a reference master file 45 is not shown, this file stores reference codes and order conditions.

#### (4) Data Files

Figs. 5(a) and 5(b) show examples of an order file 50 and a process file 51, both prepared as data files in the hard disk 2.

An order file 50, shown in Fig. 5(a), stores, without any change, order-input-slip data which have been input by using an order input slip 20. Data on items such as "client name", "business personnel name" and "goods name" are stored in order to facilitate data processing which will be performed on the basis of an order file 50.

A process file 51, shown in Fig. 5(b), is prepared if there is a stock shortage when the inventory master file 43 is checked during an order inputting processing, or if such

an order inputting causes a stock shortage. Data stored in a process file 51 include an order No., a client code, and data on the parent and child goods of combination goods, namely, goods codes, goods names, numbers of goods assigned, and numbers of goods unassigned. The stored data also include a goods code, a goods code and a number of goods assigned of a substitute good.

#### (5) Inputting Data and Outputting Forms

Fig. 6 shows the relationship between various input processings and output forms. Data necessary to order and inventory management are input in an order slip input processing 60 by using an order input slip 20. Then, a check is made in a combination goods order acceptance processing 61 as to whether or not there is sufficient stock of combination goods. When there is sufficient stock, stock-goods assignment is performed in the order acceptance processing 61. When there is not sufficient stock, an incomplete stock assignment list is prepared and output. On the basis of this list, subsequent procedures are performed.

First, it is examined whether or not there is enough time until the appointed delivery date to purchase goods having a stock shortage and receive the goods upon arrival. When there is enough time for purchase, a procedure for purchasing a required number of goods is performed. When there is not enough time for purchase, a substitute goods

assignment 62 is performed. Where substitute goods assignment is performed, a substitute goods assignment list is output.

(6) Inputting: Preparation of Order Input Slip 20

Fig. 7 shows the flow of the procedure for inputting data on an order for a certain quantity of combination goods placed by a client, that is, the procedure for preparing an order input slip 20 on the display 4 in accordance with the order for combination goods. The illustrated procedure corresponds to the order slip input processing 60 shown in Fig. 6.

First, when the operator selects item "order input slip processing" in a menu displayed on the display 4, the procedure shown in Fig. 7 is entered. An order input slip 20, such as that shown in Fig. 2, is displayed on the screen of the display 4, and the date and a placement code are automatically displayed in the beginning.

A cursor indicative of an input position is first located in the blank for item "order type". When the operator inputs a code corresponding to an order type through the keyboard 3 (Step 101), the cursor then moves to the position of item "business personnel". The operator inputs, through the keyboard 3, a certain "business personnel" code (Step 102). Similarly, the operator inputs, through the keyboard 3, codes corresponding to the

following: a client (Step 103); an end user (Step 104); a destination (Step 105); a client's order No. (Step 106); a delivery type (Step 107); a management number 1 (Step 108); designation (Step 109); a management number 2 (Step 110); and reference (Step 111). However, the operator may skip procedures for the end user, the destination, the client's order No., the management numbers 1 and 2, and reference if inputting codes for these items is not necessary in the order inputting procedure. Data input are displayed one after another at the relevant positions of the order input slip 20 on the screen.

When the inputting of data on the above items has been completed, the operator depresses a "complete" key, thereby indicating the completion of the inputting (Step 112). The CPU 1 automatically determines the name of the order type, and displays the name on the screen of the display 4. On the basis of the client code input, the client master file 32 is referred to, and a corresponding client name is retrieved from this file 32. Thus, the name of the client is also displayed.

Similarly, on the basis of the business personnel code input, the personnel master file 41 is referred to, and data retrieved therefrom is displayed on the screen of the display 4. Regarding the name of the destination, the data stored in the client master file 32 is displayed. However, where a

destination code is input, the destination master file 32 is referred to, and the name of the destination thus obtained is displayed. Regarding items "delivery" and "designation", indications "transportation by the company (or transportation by the client)" and "no designation (or a time division)" are displayed as the respective initial values of these items. However, where appropriate codes are input, priority is given to the input codes so that a name of the delivery type and a name of the designation are displayed on the basis of the input codes. Similarly, where there is a code input for item "reference", the reference master file 45 is referred to, and the resultant reference information is displayed. However, where no codes is input and reference information is directly input through the keyboard 3, priority is given to the input information.

When the above items are all displayed on the screen of the display 4 (Step 113), the cursor is then moved to the position for a goods code.

The operator inputs a goods code of the relevant combination goods (Step 114), a quantity of order (Step 115), an appointed delivery date (Step 116), a warehouse discharge date (Step 117), and auxiliary information serving as an order memorandum (Step 118). Data input are displayed one after another at the relevant positions of the order input slip 20 on the screen.



Where a plurality of different combinations of combination goods have been ordered, Steps 114 to 118 are repeated.

When inputting of data on an order has thus been completed, the operator depresses a "complete" key (119). The CPU 1 then operates to search the goods master file 30 on the basis of a goods code of combination goods input (hereinafter referred to as "the goods code (parent)"), to extract, from the file 30, a corresponding name of the goods, a corresponding unit, a corresponding order unit price, a warehouse and types, and to display the extracted data on the screen of the display 4. If an order unit price and a warehouse name are input through the keyboard 3 at this time, priority is given to the data input through the keyboard so that the order unit price and the warehouse name input are re-displayed.

The CPU 1 also operates to refer to the combination master file 31 on the basis of the goods code (parent) input through the keyboard 3, and to read a goods code (hereinafter referred to as "the goods code (child)") of a plurality of element goods constituting the combination goods as well as an element number  $K_i$  prescribed with respect to each good code (child). Then, on the basis of the goods code (child) read, the inventory master file 43 is referred to to read a number of assignable goods (an assignable number)  $m_i$  of each

element good stored in the file 43 in correspondence with each element good indicated by the goods code (child). The CPU 1 then operates to multiply the number of order N of parent good (i.e., the quantity of order input in Step 115) by the element number  $K_i$  of the element goods, thereby calculating a number of order  $NK_i$  of each element good, and to store therein the number of order  $NK_i$ . Thereafter, the assignable number  $m_i$  of each element good, read from the inventory master file 43, is compared with the number of order  $NK_i$  of each element good (thus, the number of order of each element good is indicated as: the number of order of parent good(s)  $\times$  the element number). When the assignable number  $m_i$  of an element good is smaller than the number of order  $NK_i$  of the element good, the difference ( $NK_i - m_i$ ) is stored as the number of goods unassigned (unassigned number)  $l_i$  of that element good. When the assignable number  $m_i$  of an element good is equal to or greater than the number of order  $NK_i$  of the element good, the CPU 1 stores "0" as the unassigned number of that element good.

When there is any element good having an assignable number  $m_i$  smaller than the number of order  $NK_i$ , that is, having a stock shortage, the CPU 1 operates to display the indication "incomplete" as information on incomplete stock assignment. Then, for each element good having  $m_i$  smaller than  $NK_i$ , the CPU 1 calculates how many parent goods are

permitted to be composed by the assignable numbers  $m_i$  of such element goods. When permissibility numbers  $S_i$  of parent goods have been thus obtained, the minimum  $S_{min}$  of the permissibility numbers  $S_i$  is stored as the number of goods assigned (assigned number)  $H$  of the ordered combination goods. Then, the number obtained by subtracting the minimum permissibility number  $S_{min}$  from the number of order  $N$  of the combination goods is stored as the number of goods unassigned (unassigned number)  $L$  of the combination goods. Thereafter, data to be stored in the process file 51 are prepared, and temporarily stored (Step 120). The data for storage in the process file 51 include a good code of an element good, a corresponding goods name, an unassigned number  $l_i$  of the element good, and an assigned number (= number of order  $NK_i$  - unassigned number  $l_i$ ).

Then, the cursor moves to the position for item "confirmation" of the order input slip 20. The operator inputs "9" by a key operation (Step 121). The inputting of "9" causes a shift to order acceptance confirmation (Step 122). The procedures performed by the CPU 1 in the above-described Steps 119 to 121 are shown in Fig. 18.

Fig. 8 shows procedures for checking the stock-assignment status. First, the date and the placement code are automatically displayed (Step 1220). Subsequently, in order to allow the input data on the order to be confirmed,

an order acceptance confirmation display, such as that shown in Fig. 9, is displayed on the screen (Step 1221). An upper portion of the display shows, in addition to the order number, the client code and the client name, data on the combination goods, namely, the goods code, the goods name, the quantity of order (the number of order), the assigned number, and the unassigned number. A lower portion of the display shows data on each of element goods constituting the combination goods, namely, the goods code, the goods name, the number of order (= number of order of parent good(s) x element number), and the unassigned number. Among these data, the client code, the client name, and certain data on the combination goods (that is, the goods code, the goods name and the number of order) are displayed by using the same data that has been previously displayed on the order input display. However, the order number is displayed by reading the latest order number set in the order number file 44. Further, the assigned number and the unassigned number, both of the combination goods, are those stored in Steps 120L to 120N, and the data on the element goods shown in the lower portion of the display are data prepared in Step 1200 for storage in the process file 51. The number of order of each element goods is, however, displayed by adding together the relevant assigned number and unassigned number.

By referring to data displayed, the operator is able to

check which of the element goods has a stock shortage.

Then, when the operator depresses a "complete" key to return to the display for inputting data on the order input slip 20, the order input slip 20 is again displayed containing, this time, the input data as well (Step 123). Thereafter, the cursor moves to the position of item "confirmation".

When the operator inputs "3" by a key operation, it is possible to perform further inputting from Step 101. When "7" is input by a key operation, further inputting can be performed from Step 114. Therefore, if there is any input error, or if a plurality of different combinations of combination goods have been ordered, a key operation as above is performed to enable further inputting. On the other hand, if "0" is input by a key operation, the input values are determined. Hence, updating is performed in Step 125 with respect to certain files. Regarding the inventory master file 43, the assigned number ( $N_{ki} - l_i$ ) is added, together with the order No., in a blank for an assigned number corresponding to the good code of each element good, the assigned number ( $N_{ki} - l_i$ ) is subtracted from the assignable number  $m_i$ , and the unassigned number  $l_i$  is added in a blank for unassigned-number data ( $P_i$ ). Regarding the order number file 44, "1" is added to the data on the order number stored. Subsequently, the data prepared for storage in process file

51 is set in the file 51, and predetermined items of data among the data shown in the order input slip display and the order acceptance confirmation display are written into the order file 50. Simultaneously, the order number in the order number file 44 after the updating is set in the order file 50 and the process file 51 (Step 126). Thereafter, the input data on the screen of the display 4 are cleared, which may be followed by the execution of Step 101.

When the operator depresses an "end" key, an order input slip processing concerning an order has been completed. The details of the procedures performed by the CPU 1 in Steps 124 to 127 are shown in Fig. 19.

Fig. 10 shows the flow of procedures for outputting the data input in the above-described procedures in the form of a combination goods incomplete assignment list. When the operator inputs an instruction to output a combination goods incomplete assignment list (Step 130), the CPU 1 reads the data written in the process file 51, edits the read data into a predetermined output format (Step 131), and causes the printer 5 to produce a print output having a format such as that shown in Fig. 11 (Step 132).

#### (7) Stock Assignment

Fig. 12 shows the flow of procedures for assigning a substitute good when it has been found, as a result of performing an order input processing by using an order input

slip 20, that there is a stock shortage and, simultaneously, there is not enough time, until the appointed date of delivery to the client or destination, to obtain goods having the stock shortage by ordering anew a required number of the goods. Fig. 13 shows the flow of procedures for stock assignment performed in a less urgent case where stock-shortage goods are supplemented by placing an order with a suitable supplier.

A processing for assigning a substitute good is performed by referring to a combination goods incomplete assignment list, output in the above-described manner. When the operator selects item "substitute goods assignment" in a menu displayed on the screen of the display 4, a substitute goods stock-assignment procedure, shown in Fig. 12, is entered.

First, a substitute goods assignment display, such as that shown in Fig. 14, is displayed on the display 4. The date and a placement code are automatically displayed in the beginning (Step 140).

Then, the cursor moves to a blank for item "order number". The operator refers to the relevant combination goods incomplete assignment list, and inputs an order number through the keyboard 3 (Step 141), which is followed by depressing a "complete" key (Step 142). Then, the process file 51 is checked on the basis of the order No., and the

following data are displayed on an upper portion of the substitute goods assignment display on the screen: a client code; a client name; data on combination goods (parent good) ordered, namely, a goods code, a goods name, an appointed delivery date, a quantity of order, a number of goods assigned and a number of goods unassigned; and data on each element good having a stock shortage (that is, having a number of goods unassigned that is not equal to 0), namely, a line No. on the display, a goods code, a goods name, a number of order, and a number of goods unassigned (Step 143).

A frame for inputting data on substitute goods is provided on a lower portion of the display. After the execution of Step 143, the cursor moves to a position in this frame for inputting a line No. The operator selects a certain element good, among the stock-shortage element goods displayed in the upper portion of the display, which can be substituted by other good, and inputs a line No. of each selected element good (hereinafter referred to "the good to be substituted"; it is supposed that this good has a goods code "i") (Step 144). Then, the operator selects a substitute good for substituting the selected element good (the good to be substituted that has a stock shortage) by using the operator's own memory and/or a suitable document, and inputs a good code "i'" of a selected substitute element good (Step 145). Thereafter, the operator depresses an



"complete" key (Step 146). Then, the CPU 1 refers to the goods master file 30, and reads a good name corresponding to the input goods code  $i'$  of the substitute goods so that the read goods name is displayed on the relevant line of the substitute goods assignment display on the display 4. At this time, the CPU 1 also refers to the inventory master file 43 to display an assignable number  $gi'$  of the relevant substitute good (Step 147).

The operator checks whether the displayed assignable number  $gi'$  is greater than the number or order ( $NKi$ ). If this number  $gi'$  is greater than the number  $NKi$ , the operator inputs an assignment number (which may be equal to the number of order) (Step 148). Thereafter, the operator depresses a "complete" key (Step 149). Then, the displayed assignment number of the relevant substitute good is edited, and re-displayed (Step 150). There are more than one way to assign a substitute good; a first way is to substitute only the shortage of an original element good with a substitute element good, a second way is to substitute the entire quantity of order for an original element good with a substitute element good, and a third way is to adopt a substitution degree intermediate between the above two ways. Here, the embodiment will be exemplified by the substitution of the entire quantity or order with a substitute good.

Thereafter, the cursor moves to the position of item

"confirmation" (Step 151). When the operator inputs "3" by a key operation, the execution of the procedure returns to Step 141, whereas when the operator inputs "7" by a key operation, Step 144 et seq. are executed, thereby enabling further inputting in either case. Where displaying and inputting are required for five or more stock-shortages and their substitutes, a screen scroll key can be operated to effect sequential displaying of stock-shortage goods and sequential inputting of substitute goods.

On the other hand, when the operator inputs "0" by a key operation, the CPU 1 performs, in Step 152, updating with respect to the inventory master file 43. Specifically, the CPU 1 operates to delete both the assigned number ( $NK_i - li$ ) and the unassigned number  $li$  of the original element good which correspond to the relevant order No., to add, to data on the substitute good, the assigned number (the assigned number input in Step 148; in this example, the assigned number  $NK_i$ ) of the substitute good which corresponds to the relevant order No., and to subtract the assigned number  $NK_i$  from the assignable number  $gi'$  of the substitute good. Then, the CPU 1 writes, for combination with the data on the original element good (good to be substituted) in the process file 51, the goods code  $i'$ , the goods name and the assigned number of the selected substitute good. Also, the CPU 1 calculates the total of parent goods composed which is

increased by assignment of substitute goods, deletes the unassigned number in the order file 50, and sets the resultant assigned number in this file (Step 153).

Thereafter, the input data on the screen of the display 4 is cleared, and the operator may return to the start of the flow. However, when the operator depresses an "end" key (Step 154), the stock assignment is completed. Details of the procedures performed by the CPU 1 in Steps 151 to 154 are shown in Fig. 21.

Fig. 15 shows the flow of procedures for outputting the substitute good assignment data, which have been input as described above, as a substitute good assignment list. When the operator instructs a substitute good assignment list to be output (Step 170), the CPU 1 reads data written in the process file 51, edits the read data into a predetermined format (Step 171), and causes the printer 5 to produce a print output of the data having a format, such as that shown in Fig. 16.

In the above-described processing for assigning a substitute good, the operator judges, with reference to documents, which good can be used as a substitute good (regardless of the amount of stock of this good) for substituting an element good A having a stock shortage. However, a plurality of substitute good candidates (possible substitutes) for substituting such an element good may be

previously selected so as to prepare, in the hard disk 2, a substitute goods file storing combinations of goods codes of substitute good candidates, and thus to allow the CPU 1 to display substitute good candidates which can be used. A procedure having such an arrangement is shown in Fig. 20. When the line No. of an element good A having a stock shortage has been input in Step 144 shown in Fig. 7, the CPU 1 refers to the substitute goods file, and reads goods codes of all the substitute good candidates registered in combination with the particular element good whose line No. has been input. On the basis of each good code read, the CPU 1 refers to the inventory master file 43, and reads an amount (number) of assignable goods in stock corresponding to each good code. Then, the CPU 1 compares the read amount with a required amount (number) of the element good A (although in the illustrated example, the required amount of the element good A is the number of order shown on the line of the element good A in the upper frame of the substitute goods assignment display, the required number may alternatively be an unassigned number of the element good A). When there is any substitute good candidate having an amount of stock greater than the required number of the element good A, the CPU 1 displays, on the lower frame of the substitute good assignment display, the goods code, the goods name and the assignable number of all the substitute good candidates

having such amounts of stock. The operator selects, from among the substitute good candidates displayed, a suitable substitute good candidate B, such as one having the maximum amount of stock, by suitably moving the cursor, inputs an assignment number of the selected candidate B, and depresses a "complete" key. Thus, when the assignment number of the substitute good candidate B has been input and the "complete" key has been depressed, certain displayed data on substitute good candidates other than the selected candidate B are deleted from the screen, and the goods code, the goods name, the assignable number and the assigned number of the selected candidate B are displayed on the line of the same line No. that has been input as the line No. of the original element good A. This completes the selection of a substitute good B for substituting an element good A, which selection is followed by the execution of Step 151 et seq. shown in Fig. 12.

When, as a result of the above comparison, there is no substitute good candidate having an amount of stock greater than the required amount of the element good A, the CPU 1 displays, on the lower frame of the substitute good assignment display, the goods codes, the goods names and assignable numbers of all substitute good candidates having stock amounts (assignable numbers) equal to or greater than 1. Subsequently, the operator selects, from among the

substitute good candidates displayed, some of the displayed candidates, such as candidates C, D and E, in a certain order, e.g., in the order starting with the candidate having the maximum amount of assignable stock among the displayed candidates, until the required amount is filled, and inputs assignment numbers of the selected candidates by suitably moving the cursor, which is followed by depressing a "complete" key. When the "complete" key has been depressed, the CPU 1 deletes certain displayed data on substitute good candidates other than the selected candidates (i.e., data on substitute good candidates with respect to which no assignment numbers have been input), displays the respective goods codes, goods names, assignable numbers and assignment numbers of the substitute goods C, D and E in lines starting with the line of the same line No. that has been input as the line No. of the original element good A, and gives the same line No. to these data on the substitute goods C, D and E. This completes the selection of substitute goods C, D and E for substituting the element good A, which selection is followed by the execution of Step 151 et seq. shown in Fig. 12.

Fig. 20 shows procedures performed in Steps 144 to 151 by using a substitute goods file.

Next, descriptions will be given of the case in which assignment is performed by, instead of substituting an

element good having a stock shortage with a substitute good, supplementing a stock shortage through purchase. When the operator selects item "stock assignment" in a menu displayed on the display 4, a stock assignment display, such as that shown in Fig. 17, is displayed on the screen, and a procedure shown in Fig. 13 is entered.

The cursor first moves to item "order No.". The operator inputs an order No. through the keyboard 3 (Step 160). When a "complete" key has been depressed in Step 161, the CPU 1 refers to the process file 51, and displays, at suitable positions in an upper portion of the stock assignment display on the display 4, a client code, a client name, and data on combination goods (parent good) ordered, namely, a goods code, a goods name, an appointed delivery date, a number of goods ordered, a number of goods assigned and a number of goods unassigned, while displaying, at suitable positions in a lower frame of the stock assignment display, data on each element good (child good) having a stock shortage, namely, a goods code, a goods name, a number of goods ordered (the sum of an assigned number and an unassigned number) and a number of stock shortage (a number of goods unassigned) (Step 162).

Then, the cursor moves to a position within the lower frame of the display for inputting an assigned number, and the operator inputs, through the keyboard 3, an additional

assignment number of each element good having a stock shortage, e.g., an additional assignment number  $n_j$  of an element good having a goods code  $j$  (Step 163). Here, since an assignment has already been performed during the order input slip processing, the additional assignment number  $n_j$  corresponds to a number indicating a stock-shortage of the relevant element good. When the inputting of such assignment numbers of all the element goods to be supplemented through purchase has been completed, the operator depresses a "complete" key (Step 164). Then, the assigned number of the parent good is edited and re-displayed (Step 165), and the cursor moves to the position for item "confirmation".

When the operator inputs "3" by a key operation, further inputting is possible by starting from Step 160, whereas when the operator inputs "7" by a key operation, further inputting is possible by starting from Step 163.

On the other hand, when the operator inputs "0" by a key operation, the following updating is performed in Step 167 with respect to the inventory master file 43. The additional assignment number (e.g.,  $n_j$ ) input in Step 163 is registered, together with the relevant order No., as data on the relevant element good (e.g., the element good having the goods code  $j$ ) stored in the file 43, and the additional assignment number  $n_j$  is subtracted from the assignable number  $m_j$  of the relevant element good. Normally, when an assignable number



in the inventory master file 43 becomes a minus value, the assignable number is set to 0, and the absolute value of the minus value is automatically added to the unassigned number. However, in the procedure shown in Fig. 13, an unassigned number  $P_j$  of the relevant element good stored in the inventory master file 43 already includes a stock-shortage fraction with respect to which assignment is currently being performed. In view of this fact, therefore, an absolute value  $|m_j - n_j|$  is subtracted from the unassigned number  $P_j$ , and the absolute value  $|m_j - n_j|$  is added to a purchase number  $Q_j$  of the relevant element good. Thus, since a stock-shortage fraction is to be supplemented by a purchase, and purchased goods are to be assigned to fill the order of the relevant order No., the unassigned number is decreased accordingly. The purchase number  $Q_j$  indicates the number of goods an order for which has been, or is expected to be, placed with a suitable supplier, and which have not been arrived yet; thus, among the goods covered by the purchase number, there are goods which are assigned before arrival.

Then, further updating is performed in Step 168 with respect to the process file 51 and the order file 50. Specifically, a number of assignment (which number is the sum of the assigned number set in the procedure shown in Fig. 7 and the additional assignment number  $n_j$  set in the procedure shown in Fig. 13) is set in the data on the relevant element

good stored in the process file 51, and the unassigned number of the relevant combination goods in the order file 50 is deleted, and an assigned number is set in stead.

Thereafter, the input data on the screen of the display 4 is cleared, and the operator may return to the start position of the flow. However, when the operator depresses an "end" key, the stock assignment procedure is completed. When the stock assignment processing is completed, the purchase number (increased as described above) is read from the inventory master file 43 together with data such as the relevant goods code, the goods name, and an amount of additional order for supplement, and a purchase arrangement list is output for arranging a purchase. Examples of procedures of the CPU 1 performed in Steps 166 to 169 are shown in Fig. 22.

When a plurality of different combinations of combination goods have element goods with stock shortages, the element goods in all the combinations may not be substituted or additionally purchased. Alternatively, only those element goods whose purchase requires relatively long periods may be substituted with substitute goods, with the other element goods being assigned by supplementing them through additional purchase, as shown in Fig. 13.

As has been described above, according to the present invention, an inventory management apparatus includes a

goods master file storing information on goods handled at least including information on whether each good is for sale as a single item or for sale as combination goods comprising a combination of a plurality of items, a combination goods master file storing information on element goods constituting each combination of combination goods and an element number of element goods in each combination, an inventory master file storing the numbers of stock of goods handled, an input device for inputting information on ordered goods and a quantity of order, and a processing device for checking the goods master file to determine whether or not such ordered goods are combination goods. When the ordered goods are combination goods, the processing device retrieves from the combination goods master file both element goods constituting the combination goods and an element number of the element goods, and checks the inventory master file to determine whether or not there is a sufficient number of the element goods in assignable stock for filling the quantity of order. When there is such a sufficient number of the element goods, the processing device performs a stock assignment process and an updating process in which a number of assignment is subtracted from the number of stock of the element goods stored in the inventory master file. When there is not such a sufficient number of the element goods, the processing device performs

either a process for purchasing a required number of the element goods or a process for assigning substitute goods. Therefore, inventory management of combination goods can be performed easily even by a person having no knowledge of merchandise, and, in case of an inventory shortage, suitable processing can be immediately performed in an interlocking manner.

**CLAIMS**

1. An inventory management apparatus for combination goods, comprising: a goods master file storing information on goods handled at least including information on whether each good is for sale as a single item or for sale as combination goods comprising a combination of a plurality of items; a combination goods master file storing information on element goods constituting each combination of combination goods and an element number indicating the number of element goods in each combination; an inventory master file storing the numbers of stock of goods handled; an input device for inputting information on ordered goods and a quantity of order; and a processing device for checking said goods master file to determine whether or not ordered goods input from said input device are combination goods comprising a combination of a plurality of items, said processing device being capable, when said ordered goods are combination goods, of retrieving from said combination goods master file both element goods constituting said combination goods and an element number of said element goods, and of checking said inventory master file to determine whether or not there is a sufficient number of said element goods in stock for filling said quantity of order, said processing device performing, when there is a sufficient number of said element goods in stock for filling said quantity of order, a

stock assignment process and an updating process in which a number of assignment is subtracted from the number of stock of said element goods stored in said inventory master file, said processing device performing, when there is not a sufficient number of said element goods in stock for filling said quantity of order, either a process for purchasing a required number of said element goods or a process for assigning substitute goods.

2. An inventory management apparatus for combination goods, comprising: a hard disk device for storing an inventory master file storing the numbers of stock of goods handled; an input device for inputting information on ordered goods and a quantity of order; a display device for displaying input data on a screen; and a processing device for checking said inventory master file to determine whether or not there is a sufficient number of said ordered goods in stock for filling said quantity of order, and for performing, when there is a sufficient number of said ordered goods in stock for filling said quantity of order, a stock assignment process and an updating process in which a number of assignment is subtracted from the number of stock of said ordered goods stored in said inventory master file,

said hard disk device further storing a goods master file and a combination goods master file, said goods master file storing information on goods handled at least including

information on whether each good is for sale as a single item or for sale as combination goods comprising a combination of a plurality of items, said combination goods master file storing information on element goods constituting each combination of combination goods and an element number indicating the number of element goods in each combination,

said processing device checking said goods master file to determine whether or not ordered goods input from said input device are combination goods comprising a combination of a plurality of items, said processing device being capable, when said ordered goods are combination goods, of retrieving from said combination goods master file both element goods constituting said combination goods and an element number of said element goods, and of checking said inventory master file to determine whether or not there is a sufficient number of said element goods in stock for filling said quantity of order, said processing device performing, when there is a sufficient number of said element goods in stock for filling said quantity of order, a stock assignment process and an updating process in which a number of assignment is subtracted from the number of stock of said element goods stored in said inventory master file, said processing device performing, when there is not a sufficient number of said element goods in stock for filling said

quantity of order, either a process for purchasing a required number of said element goods or a process for assigning substitute goods.

3. An inventory management apparatus for combination goods, according to claim 1 or claim 2, wherein when a process for assigning substitute goods has been entered, said processing device subtracts a number of assignment of said substitute goods from the number of stock of said substitute goods stored in said inventory master file.

4. An inventory management apparatus for combination goods, according to claim 1 or claim 2, wherein when, in a process for assigning substitute goods, said processing device has input from said input device a signal indicating a good to be substituted, a signal indicating a substitute good, and a signal indicating a number of assignment of said substitute good, said processing device checks said inventory master file to delete a number of assignment registered for said good to be substituted, and registers said number of assignment of said substitute good for said substitute good.

5. An inventory management apparatus for combination goods, according to any of claims 1 to 4, wherein said hard disk device further stores a substitute goods file in which combinations of individual element goods constituting combination goods with substitute goods for substituting



said element goods, said processing device referring, in a process for assigning a substitute good, to said substitute goods file and displays on said screen substitute good candidates for substituting a specified good to be substituted.

6. An inventory management method for combination goods, which is a type of an inventory management method for goods employing an inventory master file storing as electromagnetic data the number of stock of goods handled, a processing device, an input device for inputting necessary data to said processing device, and a display device for displaying input data on a screen, said processing device checking, when an order for a certain quantity of goods has been received, the amount of stock of said ordered goods by referring to said inventory master file, and performing, when said amount of stock is greater than said quantity of order, the registering of said quantity of order as a number of assignment in said inventory master file and the rewriting of said amount of stock stored to a number decreased by said number of assignment,

said inventory management method for combination goods | comprising the steps of:

preparing beforehand a goods master file and a combination goods master file, said goods master file storing as electromagnetic data information on goods handled

at least including information on whether each good is for sale as a single item or for sale as combination goods comprising a combination of a plurality of items, said combination goods master file storing as electromagnetic data information on element goods constituting each combination of combination goods and an element number indicating the number of element goods in each combination; and

performing necessary procedures when an order for a certain quantity of goods has been received, said necessary procedures including

checking said goods master file to determine whether or not ordered goods are combination goods comprising a combination of a plurality of items,

when said ordered goods are combination goods, said necessary procedures further including

retrieving from said combination goods master file both element goods constituting said combination goods and an element number of said element goods, and

checking said inventory master file to determine whether or not there is a sufficient number of said element goods in stock for filling said quantity of order,

when there is a sufficient number of said element goods in stock for filling said quantity of order, said necessary procedures further including performing a stock assignment

process using said inventory master file and an updating process in which a number of assignment is subtracted from the number of stock of said element goods stored in said inventory master file,

when there is not a sufficient number of said element goods in stock for filling said quantity of order, said necessary procedures further including displaying on said screen at least names of those element goods having stock shortages and a number of each shortage, and

making a judgement for each element good having a stock shortage on whether a process for purchasing a required number of said element goods or a process for assigning substitute goods in stead of said element goods is to be performed,

when substitute goods are to be assigned, said necessary procedures further including specifying a good to be substituted on said screen,

inputting a signal for indicating a substitute good for substituting the specified good to be substituted,

retrieving data on said substitute good from said inventory master file,

displaying the name and the amount of stock of said substitute good thus obtained,

inputting a number of assignment of said substitute good displayed on said screen,

searching said inventory master file when said number of assignment of said substitute good has been input from said input device,

deleting a number of assignment registered for said specified good to be substituted, and

registering said number of assignment of said substitute good for said substitute good,

when a required number of goods is to be purchased, said necessary procedures further including inputting a first assignment number of a particular element good displayed on said screen, said first assignment number indicating a fraction to be covered by a purchase,

retrieving data on said particular element good from said inventory master file,

adding said first assignment number to a second assignment number already registered for said particular element good, and

adding said first assignment number to a purchase number already registered for said particular element good.

7. An inventory management method for combination goods, which is a type of an inventory management method for goods employing an inventory master file storing as electromagnetic data the number of stock of goods handled, a processing device, an input device for inputting necessary data to said processing device, and a display device for

displaying input data on a screen, said processing device checking, when an order for a certain quantity of goods has been received, the amount of stock of said ordered goods by referring to said inventory master file, and performing, when said amount of stock is greater than said quantity of order, the registering of said quantity of order as a number of assignment in said inventory master file and the rewriting of said stored amount of stock to a number decreased by said number of assignment,

said inventory management method for combination goods comprising the steps of:

preparing beforehand a goods master file, a combination goods master file and a substitute goods file, said goods master file storing as electromagnetic data information on goods handled at least including information on whether each good is for sale as a single item or for sale as combination goods comprising a combination of a plurality of items, said combination goods master file storing as electromagnetic data information on element goods constituting each combination of combination goods and an element number indicating the number of element goods in each combination, said substitute goods file storing as electromagnetic data combinations of element goods with substitute goods for substituting said element goods; and

performing necessary procedures when an order for a

certain quantity of goods has been received, said necessary procedures including

checking said goods master file to determine whether or not ordered goods are combination goods comprising a combination of a plurality of items,

when said ordered goods are combination goods, said necessary procedures further including

retrieving from said combination goods master file both element goods constituting said combination goods and an element number of said element goods, and

checking said inventory master file to determine whether or not there is a sufficient number of said element goods in stock for filling said quantity of order,

when there is a sufficient number of said element goods in stock for filling said quantity of order, said necessary procedures further including performing a stock assignment process using said inventory master file and an updating process in which a number of assignment is subtracted from the number of stock of said element goods stored in said inventory master file,

when there is not a sufficient number of said element goods in stock for filling said quantity of order, said necessary procedures further including displaying on said screen at least names of those element goods having stock shortages and a number of each shortage, and

making a judgement for each element good having a stock shortage on whether a process for purchasing a required number of said element goods or a process for assigning substitute goods in stead of said element goods is be performed,

when substitute goods are to be assigned, said necessary procedures further including specifying a good to be substituted on said screen,

retrieving from said substitute goods file a substitute good for substituting the specified good to be substituted,

retrieving from said inventory master file data on said substitute good thus obtained,

displaying the name and the amount of stock of said substitute good,

inputting a number of assignment of said substitute good displayed on said screen,

searching said inventory master file for data on said substitute good when said number of assignment of said substitute good has been input from said input device,

deleting a number of assignment registered for said specified good to be substituted, and

registering said number of assignment of said substitute good for said substitute good,

when a required number of goods is to be purchased, said necessary procedures further including inputting a

first assignment number of a particular element good displayed on said screen, said first assignment number indicating a stock-shortage fraction to be covered by a purchase,

retrieving data on said particular element good from said inventory master file,

adding said first assignment number to a second assignment number already registered for said particular element good, and

adding said first assignment number to a purchase number already registered for said particular element good.

---